BJC/PAD-264

Groundwater Protection Plan for the Paducah Gaseous Diffusion Plant Paducah, Kentucky

Date Issued –August 2001

Prepared by
CDM Federal Services Inc.,
under contract 23900-SC-RM056F

Prepared for the
U.S. Department of Energy
Office of Environmental Management

by

BECHTEL JACOBS COMPANY LLC
Managing the
Environmental Management Activities at the
East Tennessee Technology Park
Oak Ridge Y-12 Plant Oak Ridge National Laboratory
Paducah Gaseous Diffusion Plant Portsmouth Gaseous Diffusion Plant
under contract DE-AC05-98OR22700
for the
U.S. DEPARTMENT OF ENERGY

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FIGURES

ACRONYMS

A	annual inspection
A-TS	inspect only, transducer in well
AB	abandoned
AB-IP	abandoned in place
amsl	above mean sea level
BC	Bayou Creek
BJC	Bechtel Jacobs Company LLC
CDM	CDM Federal Programs Corporation
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
D&D	Decontamination and Decommissioning
DMSA	DOE Material Storage Area
DOE	U.S. Department of Energy
DOD	U.S. Department of Defense
EM	Environmental Management
ER	Environmental Restoration
EW	extraction well
404G	C-404 Landfill groundwater well
GERT	General Employee Radiological Training
GET	General Employee Training
GWESQ	groundwater surveillance quarterly well
GWESSA	groundwater surveillance semiannual well
GWNEQ	groundwater Northeast Plume quarterly well
GWNWQ	groundwater Northwest Plume quarterly well
GWPP	Groundwater Protection Plan
GWRESM	groundwater residential monthly well
GWRESS	groundwater residential semiannual well
H_2SO_4	Sulfuric acid
HSWA	Hazardous and Solid Waste Amendments
KAR	Kentucky Administrative Regulation
KDWM	Kentucky Division of Waste Management
KG	C-746-K Landfill groundwater well
KOW	Kentucky Ordnance Works
KPDES	Kentucky Pollutant Discharge Elimination System
LBC	Little Bayou Creek
LCD	Lower Continental Deposits
LMES	Lockheed Martin Energy Systems, Inc.
MMES	Martin Marietta Energy Systems, Inc.
MW	monitoring well
MW66M	monitoring well 66 monthly monitoring
NA	not applicable
NaOH	sodium hydroxide
NFA	no further action
NOV	Notice of Violation
NR	not required
NRC	Nuclear Regulatory Commission
NS	not sampled
PCB	polychlorinated biphenyl

PGDP	Paducah Gaseous Diffusion Plant
PZ	piezometer
Q	quarterly inspection
RADCON	Radiological Controls
RCRA	Resource Conservation and Recovery Act
RCW	recirculating cooling water
RGA	Regional Gravel Aquifer
ROD	Record of Decision
SG	C-746-S & -T Landfill groundwater well
SWMU	solid waste management unit
^{99}Tc	technetium-99
TCE	trichloroethene
TRU	transuranic
TSCA	Toxic Substances Control Act of 1976
^{234}U	uranium-234
^{235}U	uranium-235
^{238}U	uranium-238
UCD	Upper Continental Deposits
UCRS	Upper Continental Recharge System
UF_4	uranium tetrafluoride
UF_6	uranium hexafluoride
UG	C-746-U Landfill groundwater well
UO_3	uranium trioxide
USEC	United States Enrichment Corporation
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UST	underground storage tank
WAG	waste area group
WKWMA	West Kentucky Wildlife Management Area
WLA	water level collected annually
WLQ	water level collected quarterly
WL-NE	water level collected under Northeast Pump and Treat Operations

EXECUTIVE SUMMARY

The U.S. Department of Energy (DOE) prepared and began implementation of a Groundwater Protection Plan (GWPP) in August 1995 for the Paducah Gaseous Diffusion Plant (PGDP). Per *Section 4(3) of 401 Kentucky Administrative Regulation (KAR) 5:037*, this plan is to be revised every three years. The following document is the required three-year revision of the 1998 GWPP. This GWPP addresses the following specific requirements listed in *Section 3(3) of 401 KAR 5:037*: 1) general information regarding the facility and its operation; 2) identification of activities associated with the facility as identified in Section 2 of the regulation; 3) identification of all practices chosen for the plan to protect groundwater from pollution; 4) implementation schedules for the protection practices; 5) description of and implementation schedule for employee training necessary to ensure implementation of the plan; 6) schedule of required inspections, as applicable; and 7) certification of the plan by the appropriate PGDP representative.

A Groundwater Protection Program Plan prepared according to the requirements of DOE 5400.1 currently exists at PGDP. Although the titles of the Groundwater Protection Program Plan and the GWPP are similar, the focus, purpose, and content of each plan are very different. The GWPP focuses on the prevention of groundwater contamination and on those procedures and practices currently in place to support groundwater contamination prevention efforts at PGDP. Therefore, more details concerning the construction and operation of existing facilities are provided in the GWPP.

1. INTRODUCTION

The Groundwater Protection Plan (GWPP) has been written in accordance with *401 Kentucky Administrative Regulation (KAR) 5:037* to ensure protection for all current and future uses of groundwater and to prevent additional groundwater pollution. This plan will be implemented under the direction of the U.S. Department of Energy (DOE) Site Manager and is applicable to the DOE activities at the Paducah Gaseous Diffusion Plant (PGDP), Post Office Box 1410, Paducah, Kentucky, 42002-1410.

This GWPP is submitted to address facilities, sites, and activities administered by DOE. These sites include specifically delineated areas within property of the DOE, the U.S. Department of Defense (DOD), and the Kentucky Ordnance Works (KOW), and a few concrete rubble piles located on Commonwealth of Kentucky property in the Ballard County Wildlife Management Area (Figs. 1 and 2).

As stipulated in *401 KAR 5:037*, this GWPP is to be reviewed every three years; however, amendments to the GWPP will be made as necessary to address new or modified activities and the requirements of audits/surveillances. Inspection records will be retained for a period of at least six years after their preparation. Reference documents listed herein are available through the PGDP Kevil Document Management Center in Kevil, Kentucky.

1.1 PGDP DESCRIPTION

PGDP, located in western Kentucky, is an active uranium enrichment facility owned by the DOE. Since its construction in 1952, PGDP's primary function has been the extraction of the fissionable isotope uranium-235 (^{235}U) from natural assay uranium using gaseous diffusion of uranium hexafluoride (UF_6). Plant activities have included utility, laboratory, and maintenance support; conversion of uranium dioxide to UF_6 (to feed the diffusion process); uranium tetrafluoride and metal production from depleted UF_6; and uranium metal processing, metals recovery, and other small operations performed for DOE and DOD, such as precision machining and protective metal coating application. Only the diffusion process, its support, and environmental remediation and waste management are currently active at PGDP.

On July 1, 1993, DOE leased the plant production operations facilities to the United States Enrichment Corporation (USEC). Active enrichment and support activities are addressed in the PGDP GWPP for USEC. Personnel of USEC address any environmental concerns related to these activities and facilities. Environmental concerns that existed prior to July 1993 or that can be attributed to activities that occurred prior to July 1993 are addressed by DOE. DOE is also responsible for any concerns that resulting from DOE or subcontractor work since plant construction, including all operational and environmental work related to DOE activities, and for a select set of DOD facilities at the KOW. A total of 194 facilities and areas are presently identified as DOE "property" (Appendix A).

1.2 KOW DESCRIPTION

The KOW, which is now the responsibility of the U.S. Army Corps of Engineers is located immediately adjacent to DOE property and has been designated a Wildlife Management Area (Fig. 1). During World War II explosive materials (trinitrotoluene and glyceroltrioleate) were produced at the KOW and associated activities included ordnance production and maintenance support. Some KOW facilities are included in DOE's list of environmental remediation concerns because DOE may have used these facilities during the earlier phases of PGDP construction (i.e., sewage plant).

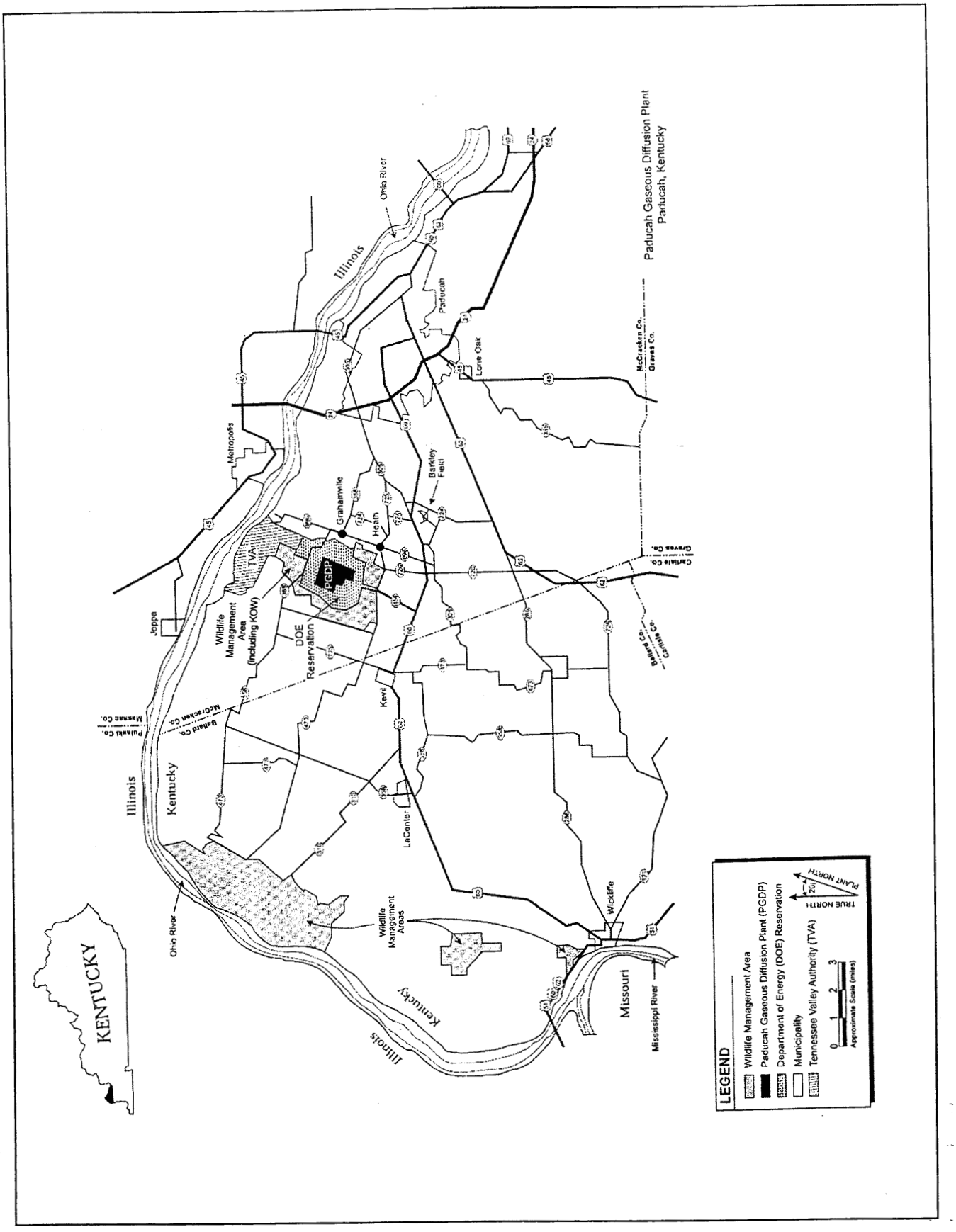
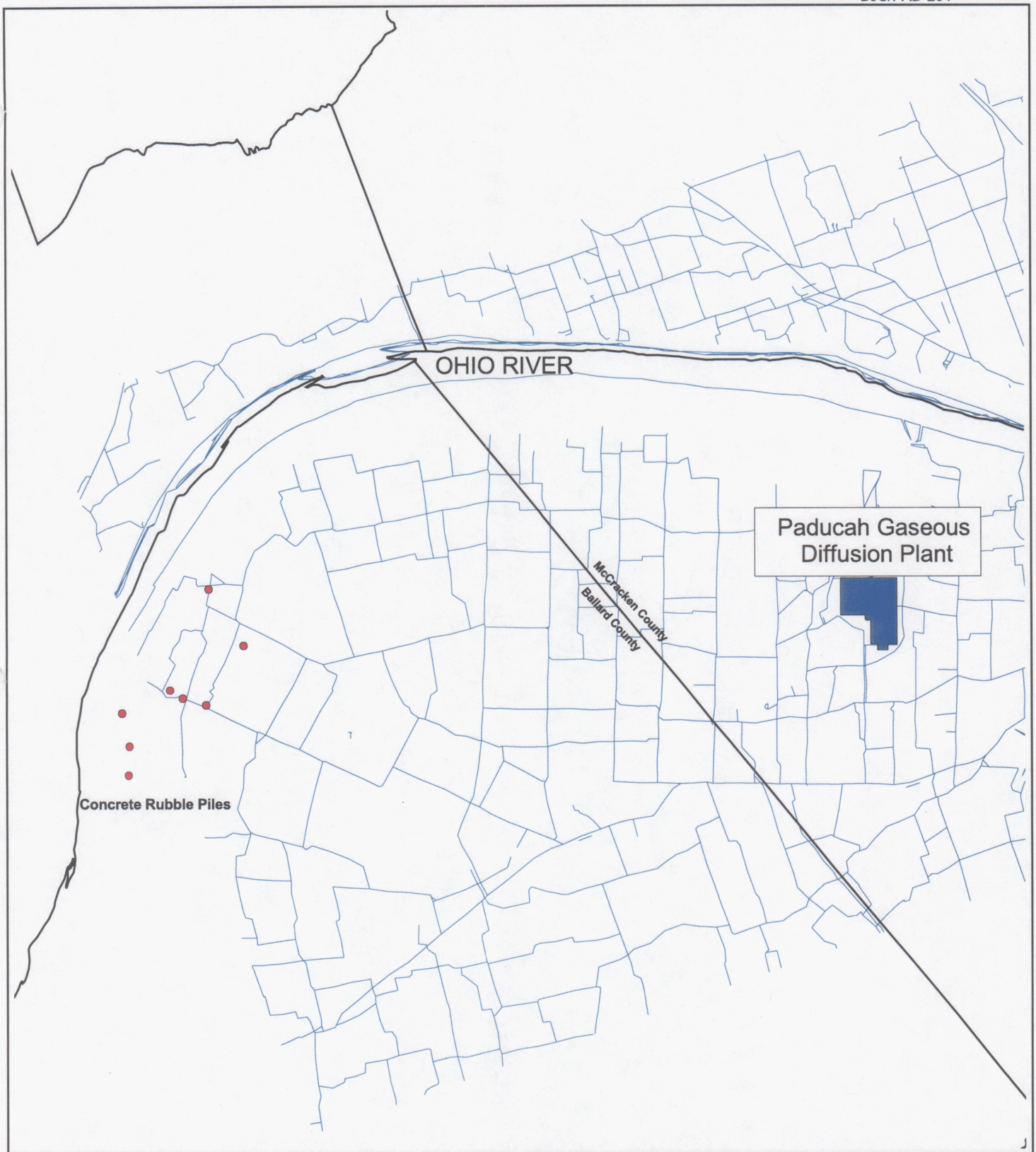


Fig. 1. PGDP location map.



LEGEND:
- County Line
- PGDP Boundary
- Roads

5000 0 5000 10000 Feet

TRUE NORTH 20° PLANT NORTH

U.S. DEPARTMENT OF ENERGY
DOE OAK RIDGE OPERATIONS
PADUCAH GASEOUS DIFFUSION PLANT

BECHTEL JACOBS COMPANY LLC
MANAGED FOR THE US DEPARTMENT OF ENERGY UNDER US GOVERNMENT CONTRACT DE-AC-05-98OR22700
Oak Ridge, Tennessee • Paducah, Kentucky• Portsmouth, Ohio

Fig. 2 Concrete Rubble Piles, SWMUs in Ballard County.

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Source: Tetra-Tech, YYYY-filename.apr

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2. PHYSICAL CHARACTERISTICS

The PGDP site is heavily industrialized; however, the area surrounding the plant is mostly agricultural and open land, with some forested areas. The West Kentucky Wildlife Management Area (WKWMA) that borders PGDP to the north, west, and south is an important recreational resource. Figures 3 and 4 illustrate the reasonably anticipated future land use and the current mixed industrial and recreational land use of the PGDP area, respectively. The geomorphology, geology, and hydrology of this facility and surrounding areas have undergone extensive study, review, and documentation. In-depth area descriptions may be found in the *Paducah Gaseous Diffusion Plant Groundwater Protection Management Program* (CDM 2000a) and numerous other DOE documents describing the site.

2.1 GEOMORPHOLOGY

Located in the Jackson Purchase region of western Kentucky, PGDP lies within the northern tip of the Mississippi Embayment portion of the Gulf Coastal Plain Province. The DOE property is characterized by almost flat areas and low gently sloped hills (<50 ft of vertical relief). Drainage patterns are naturally dendritic, but have been modified to follow roads within the area surrounded by the PGDP security fence. Additional modifications to natural drainage patterns include enhancement of drainage rates by grading most areas to promote surface runoff.

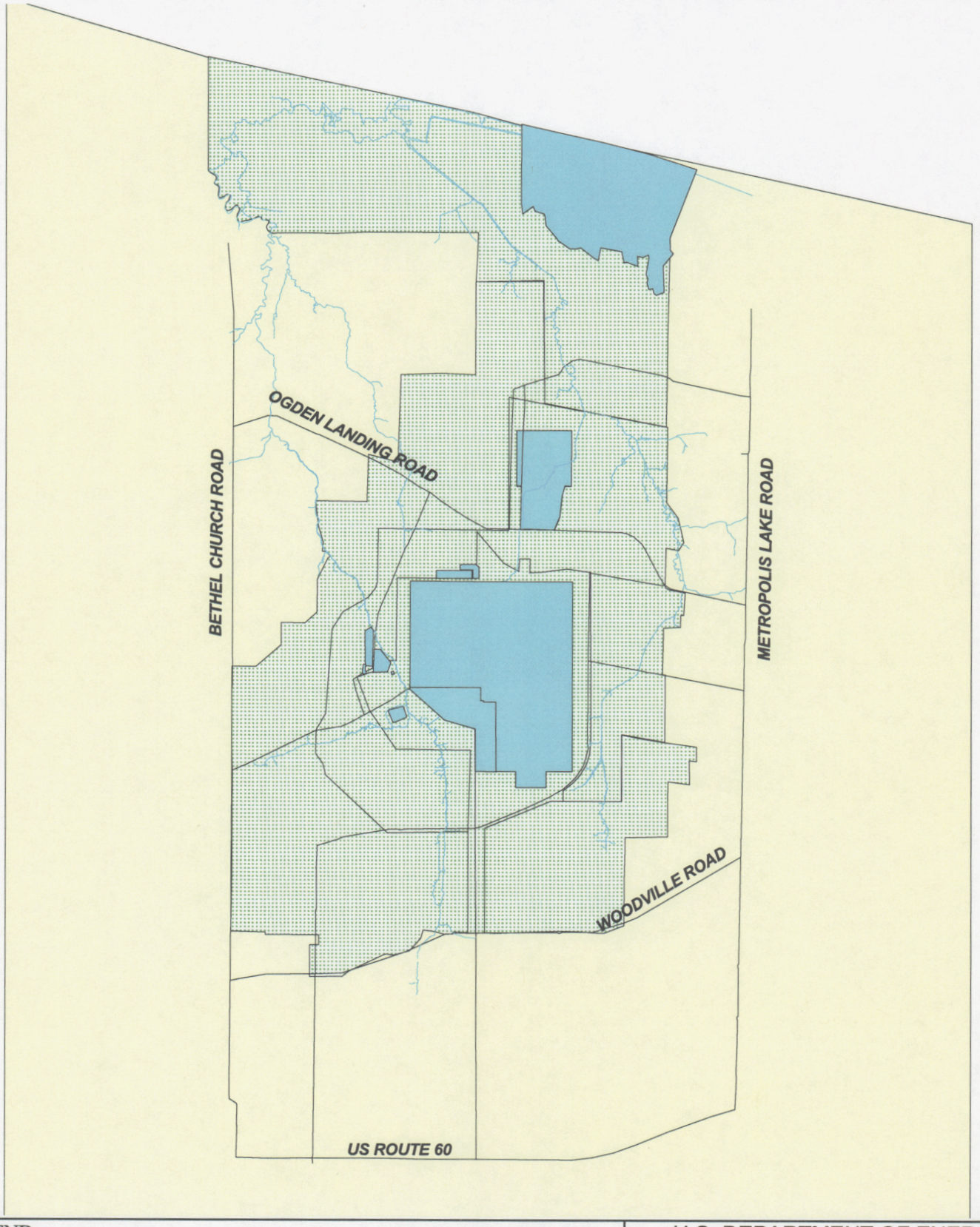
2.2 SITE GEOLOGY

The stratigraphic sequence in the region consists of Cretaceous, Tertiary, and Quaternary sediments unconformably overlying Paleozoic bedrock. Figure 5 shows a columnar section of the geology of the Jackson Purchase Region and Fig. 6 presents a cross-section schematic that illustrates regional stratigraphic relationships near PGDP.

Paleozoic bedrock beneath the PGDP site is comprised of Mississippian-age limestone. In the vicinity of PGDP, the bedrock is directly overlain by interbedded and interlensing sand, silt, and clay of the Upper Cretaceous McNairy Formation. Data indicate that sand may account for 40 to 50% of the McNairy Formation at PGDP. The Upper Cretaceous Tuscaloosa Formation, which directly overlies Paleozoic bedrock to the north, has not been encountered during drilling activities conducted at PGDP. The Paleocene Porters Creek Clay occurs in the southern portions of the site and consists of dark gray to black clay with varying amounts of silt and fine-grained micaceous, commonly glauconitic, sand. The Porters Creek Clay subcrops along a buried terrace slope that extends east-west across the site. Eocene sediments, consisting of interbedded and interlensing sand, silt, and clay, overlie the Porters Creek Clay in the extreme southern portion of the DOE reservation.

Miocene (?)[1], Pliocene, and Pleistocene continental deposits unconformably overlie Cretaceous through Eocene strata at the PGDP site. The thicker sequence of Pleistocene continental deposits represents a valley fill that comprehensively comprises a thick, fining upward sequence. The continental deposits extend from the southern end of the plant site to the Ohio River and overlay an unconformable surface

[1] Historically, the geologic section used at PGDP reflects the stratigraphy as mapped by Wilds W. Olive in the United States Geological Survey (USGS) publication "*Geologic Maps of the Jackson Purchase Region, Kentucky*" (USGS 1980). This document was published in 1980 in cooperation with the Kentucky Geologic Society. At PGDP, the Miocene (?) designation indicates the probable age of the terrace gravels.



LEGEND:

- Industrial Use
- Recreational Use
- Rural Residential

2000 0 2000 4000 Feet

TRUE NORTH 20° PLANT NORTH

U.S. DEPARTMENT OF ENERGY
DOE OAK RIDGE OPERATIONS
PADUCAH GASEOUS DIFFUSION PLANT

BECHTEL JACOBS COMPANY LLC
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Fig. 3 Reasonably Anticipated Future Land Use.

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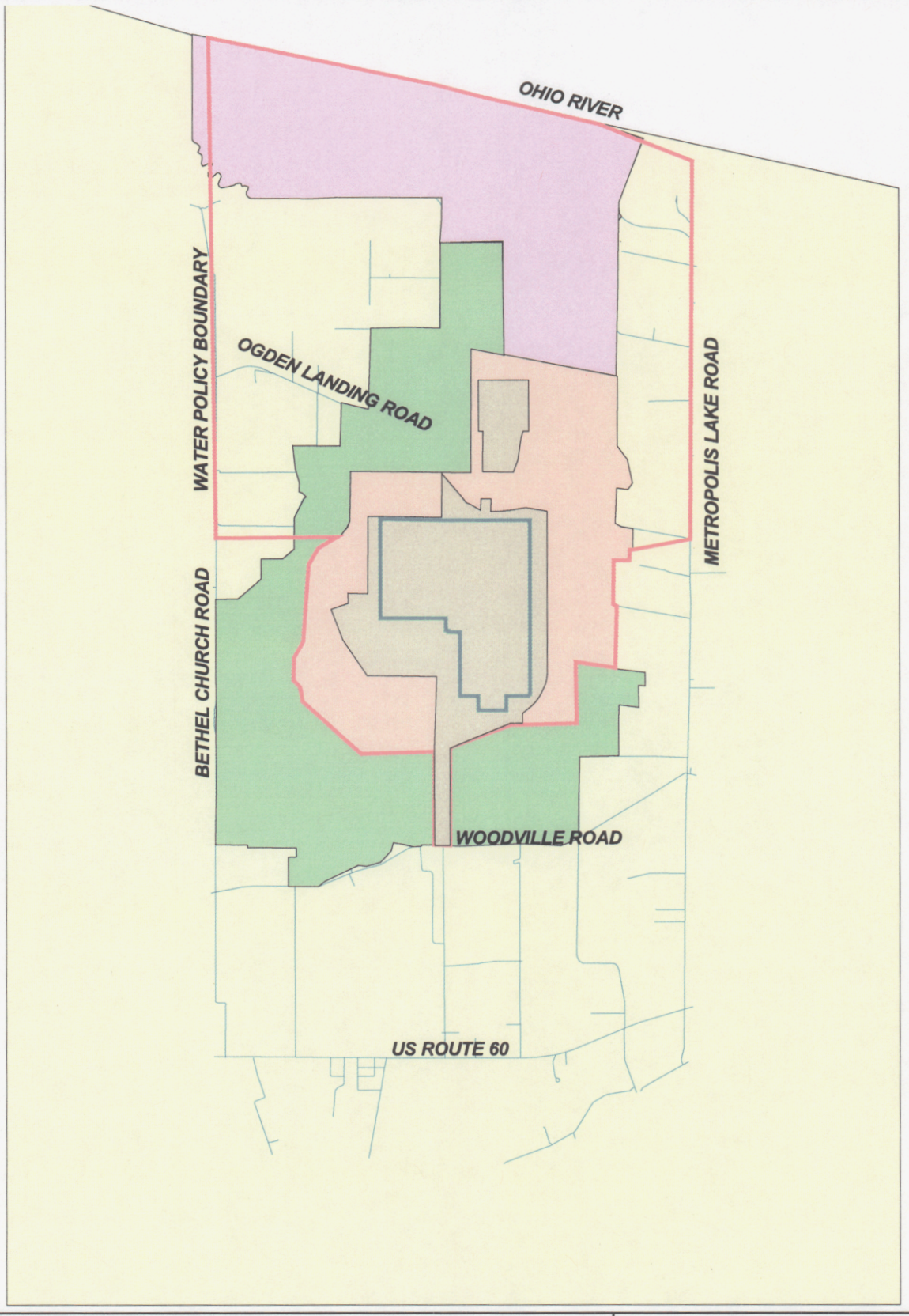

LEGEND:

- PGDP Fence
- DOE Owned Industrial Area
- Water Policy Boundary
- WkWM Owned by KDWFR
- DOE Property Leased to KDWFR
- TVA Boundary
- Rural Residential

2000 0 2000 4000 Feet

TRUE NORTH 20° PLANT NORTH

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Fig. 4 Mixed Industrial / Recreational Current Use.

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Source: Tetra-Tech, 2001-filename.apr

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SYSTEM	SERIES	FORMATION	THICKNESS (IN FEET)	DESCRIPTION	HYDROGEOLOGIC SYSTEMS
QUATERNARY	PLEISTOCENE AND RECENT	ALLUVIUM	0-40	Brown or gray sand and silty clay or clayey silt with streaks of sand.	Upper Continental Recharge System (UCRS)
	PLEISTOCENE	LOESS	0-43	Brown or yellowish-brown to tan unstratified silty clay	
	PLEISTOCENE	CONTINENTAL DEPOSITS	3-121	Upper Continental Deposits (Clay Facies) – mottled gray and yellowish brown to brown clayey silt and silty clay with some very fine sand. Trace of gravel. Often micaceous	
				Lower Continental Deposits (Gravel Facies) – reddish-brown clayey, silty, sandy chert gravel and beds of gray sand.	Regional Gravel Aquifer
	PLIOCENE-MIOCENE (?)				
TERTIARY	EOCENE	JACKSON, CLAIBORNE, AND WILCOX FORMATIONS	0-200+	Red, brown, or white fine-to-coarse grained sand. Beds of white to dark gray clay are distributed at random.	McNairy Flow System
			0-100+	White to gray sandy clay, clay conglomerates and boulders, scattered clay lenses and lenses of coarse red sand. Black to dark gray lignitic clay, silt or fine-grained sand.	
	PALEOCENE	PORTERS CREEK CLAY	0-200	Dark gray, slightly to very micaceous clay. Fine-grained clayey sand, commonly glauconitic in the upper part. Glauconitic sand and clay at the base.	
		CLAYTON FORMATION	Undetermined	Lithologically similar to the underlying McNairy Formation.	
UPPER CRETACEOUS		McNAIRY FORMATION	200-300	Grayish-white to dark gray micaceous clay, often silty, interbedded with light gray to yellowish-brown very fine-to-medium grained sand with lignite and pyrite. The upper part is interbedded clay and sand, and the lower part is sand.	
		TUSCALOOSA FORMATION	Undetermined	White, well-rounded, or broken chert gravel with clay.	
MISSISSIPPIAN		MISSISSIPPIAN CARBONATES	500+	Dark gray limestone and interbedded chert with some shale.	

Fig. 5 Lithostratigraphic column of the Jackson Purchase Region.

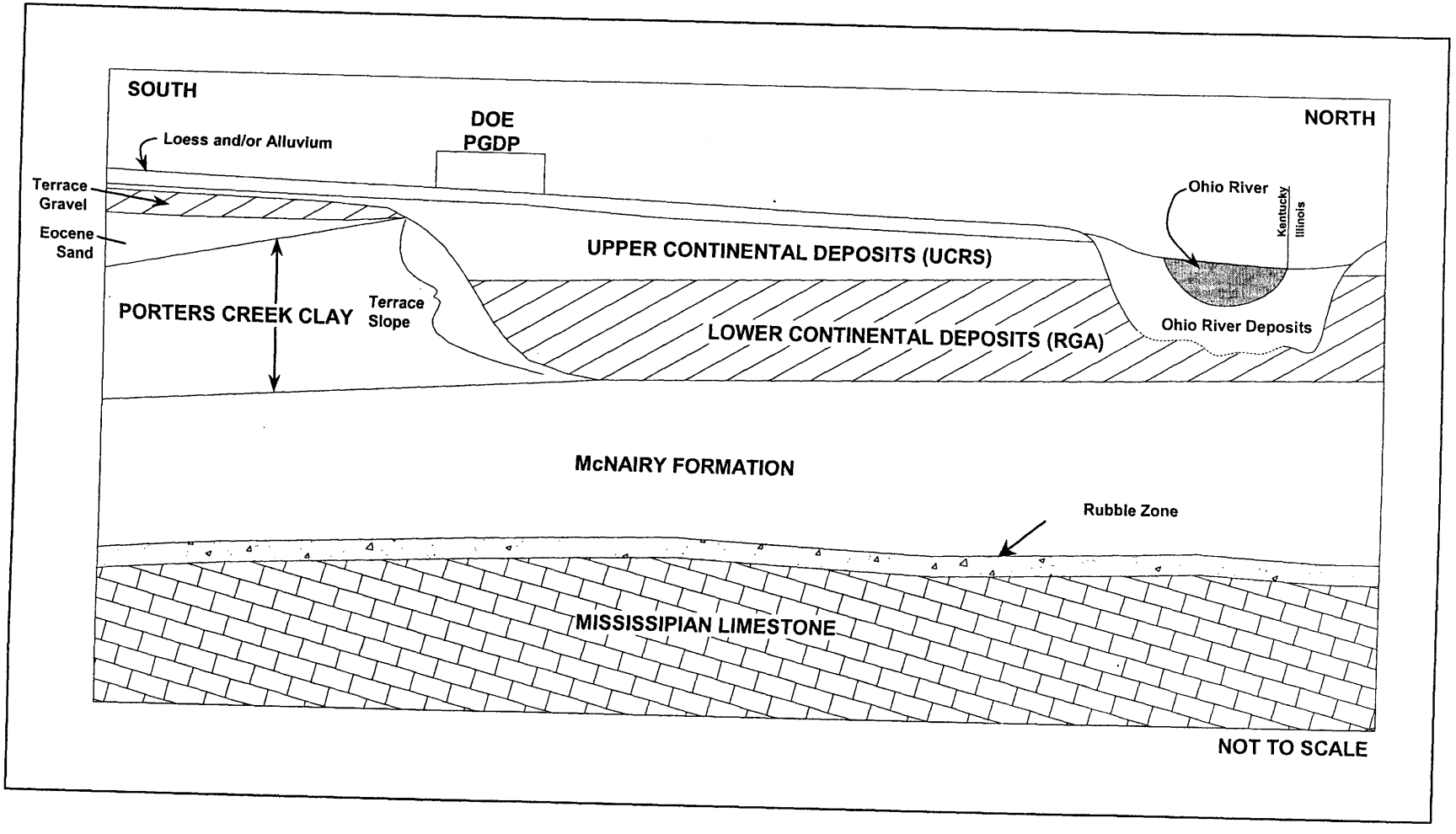

Fig. 6 Schematic of stratigraphic and structural relationships near PGDP.

that exhibits steps or terraces. These continental deposits have been divided into a basal gravel facies [lower continental deposits (LCD)] and an upper, fine-grained clastic facies [upper continental deposits (UCD)].

The LCD consists of chert gravel in a matrix of poorly sorted sand and silt. This basal gravel facies has been identified at three horizons at PGDP. A Miocene (?), Pliocene age facies, ranging in thickness from 0 to 30 ft and averaging less than 10 ft, exists in the southern portions of the site, occurring on the upper surfaces of a buried terrace at elevations greater than 350 ft above mean sea level (amsl). A second gravel facies, ranging in thickness from 15 to 20 ft, exists in southeastern and eastern portions of the site occurring on an erosional surface at approximately 320 to 345 ft amsl. The third, and most prominent of the three gravel facies beneath the site, consists of Pleistocene deposits that overlie an erosional surface north of the buried Porters Creek Terrace. Elevations of this facies vary from approximately 245 to 310 ft amsl. Overall the LCD has an average thickness of approximately 30 ft, but thicker deposits, up to -70 ft, exist in deeper scour channels that trend east-west across the site.

The UCD is primarily a fine-grained, clastic facies varying in thickness from 15 to 55 ft and consisting of clayey silt with lenses of sand and occasional gravel. The UCD represent sediments deposited in a fluvial and lacustrine environment (Finch 1967, Frye et. al. 1972). Widespread lacustrine sedimentation was deposited along the present Ohio and Tennessee River valleys when they became choked from draining glaciated areas. These sediments dammed valleys of tributaries, creating slackwater lakes that resulted in deposition of fine-grained sediments. Depending on stages of glaciation, periods of lacustrine deposition were followed by periods of erosion. As aggradation of the fluvial system continued, stream gradients in the ancestral Tennessee River and tributaries lessened. Lower gradients likely favored a transition from a braided environment to a meandering environment. A very gravelly lower sequence that becomes sandier upward identifies the transition in the subsurface.

Eolian origin loess, consisting of yellowish-brown silt and clayey silt, overlies the continental deposits at the site and varies in thickness from approximately 5 to 25 ft with an average of approximately 15 ft. Holocene alluvial deposits occur at lower elevations within the Ohio River floodplain north of the plant site.

2.3 SITE HYDROLOGY

Local groundwater flow near PGDP occurs in the unconsolidated sediments of the Cretaceous McNairy Formation, Pliocene Terrace Gravel, and Pleistocene LCD and UCD. Terms describing the hydrogeologic flow systems that generally correspond to these lithostratigraphic units are the McNairy Flow System, Pliocene Terrace Gravel, Regional Gravel Aquifer (RGA), and Upper Continental Recharge System (UCRS). The following are brief descriptions of the four components of the groundwater flow system:

1. **McNairy Flow System**–Formerly termed the deep groundwater system, this component consists of the interbedded and interlensing sand, silt, and clay of the McNairy Formation. Sand facies account for 40 to 50% of the total formation thickness of approximately 225 ft.

2. **Terrace Gravel**–This component consists of Pliocene-aged gravel deposits found at elevations higher than 350 ft amsl in the southern portion of the plant site. These deposits usually lack sufficient thickness and saturation to constitute an aquifer and are typically characterized by an unsorted mix of sand to cobble-sized materials.

3. **RGA**–This component consists of the Quaternary sand and gravel facies of the LCD and Holocene alluvium found adjacent to the Ohio River. In addition, the RGA includes contiguous sands of the UCD and the McNairy Formation. The RGA is commonly thicker than the Pliocene gravel deposits, with an average thickness of 30 feet, and ranges up to 70 feet in thickness along an axis that trends east to west through the plant site. The RGA, which extends well beyond the site boundary, is the primary aquifer used locally with recharge primarily from the UCRS and terrace gravels.

4. **UCRS**–Formerly termed the shallow groundwater system, this component consists of the UCD, excluding sand adjacent to the LCD. The sand and gravel lithofacies are relatively discontinuous. The most prevalent sand and gravel deposits occur at an elevation of approximately 345 to 351 ft amsl, with less prevalent deposits occurring at an elevation of 337 to 341 ft amsl. Groundwater flows downward into the RGA from the UCRS in the vicinity of PGDP.

The local groundwater flow system at PGDP is bound topographically controlled recharge and discharge areas to the south and north, respectively. Recharge within the Eocene sands has resulted in a groundwater divide located southwest of PGDP. Flow originates south of the PGDP site within the Eocene sands and subsequently moves into the Pliocene Terrace Gravels. Groundwater within the Pliocene gravels either discharges to local streams or flows into the RGA, which eventually discharges to the Ohio River, the local base level for the system. The main recharge for the RGA is primarily through vertical flow from the UCRS.

Toward the southern part of PGDP, the RGA is either truncated or thins and grades laterally into the Pliocene Terrace Gravels. The restriction results in a high hydraulic potential and probably causes groundwater discharge to adjoining streams. In the north-central portion of the plant site, the lower gradients are a result of the thicker LCD. Further north, near the Ohio River, the hydraulic gradient increases as a result of either a thinner section of the RGA or the low permeability of bottom sediments in the Ohio River. The primary pathway of groundwater flow at PGDP is within the RGA, which dominates the flow regime.

The RGA lies at depth and receives recharge via underflow from the Pliocene Terrace Gravels to the south and from vertical migration through the UCRS. The discontinuous nature of sands and gravels in the UCRS and the large vertical gradient require groundwater flow in the UCRS to be oriented downward. Indeed, measured hydraulic gradients and results from numerical analyses suggest that most of the water entering the shallow system flows vertically into the RGA. Some horizontal flow in the UCRS likely occurs; however, it is insignificant near the PGDP site due to the lateral discontinuity of shallow sand and gravel lenses. Groundwater flow in the RGA is to the north and discharges into the Ohio River. Hydraulic conductivities of the RGA range from 100 to 1000 ft per day. Existing regional maps and borehole logs indicate the RGA is thin or absent beneath the Ohio River, suggesting that flow under the river is unlikely.

3. ACTIVITIES

KAR 5:037, Section 2(2) lists those activities for which groundwater protection plans shall be prepared and implemented. The minimum activities which apply to DOE at PGDP include 2(2)(f) "Storing, treating, disposing, or related handling of hazardous waste, solid waste, or special waste in landfills, incinerators, surface impoundments, tanks, drums or other containers, or in piles" and 2(2)(m) "Installation, construction, operation, or abandonment of wells, bore holes, or core holes".

KAR 5:037, Section 2(4) lists several activities performed at PGDP that are excluded from the provisions of this administrative regulation. These activities include, but are not limited to, Section 2(4)(a) "Normal use or consumption of products sized and packaged for personal use by individuals", Section 2(4)(j) "Emergency response activities conducted in accordance with local, state, and federal law", Section 2(4)(k) "Fire fighting activities", and Section 2(4)(l) "Conveyance or related handling by motor vehicle, rolling stock, vessel, or aircraft".

Operations at PGDP are conducted in numerous facilities and areas. Appendix A lists 194 facilities and areas at PGDP that are associated with DOE activities. In this table, each facility or area is described by name, location (in accordance with the commonly used plant-visitors map), operational status, solid waste management unit (SWMU) or waste area group (WAG) designation, drainage, and monitoring activities. Locations of primary facilities and areas are noted in Drawing 1. SWMU designations are listed in Appendix B and their locations are noted in Drawing 2. Drawings 1 and 2 can be found in front of Appendix A. Further information concerning the PGDP facilities may be obtained from the associated engineer drawings. A listing of these drawings is provided in Appendix C.

WESKEM, LLC, a subcontractor to Bechtel Jacobs Company LLC (BJC), performs regular inspections of these facilities and areas to ensure established groundwater protection practices are in place and properly functioning. Inspection requirements and schedules are listed in WESKEM, LLC, Procedure No. W-520-PWOS, *Paducah Facility Walkthroughs*.

4. GROUNDWATER PROTECTION PRACTICES

Since April 1, 1998, BJC has been responsible for the implementation of the Environmental Management (EM) Program at PGDP. To ensure that groundwater at PGDP is protected from unnecessary pollution, DOE, BJC, and their associated subcontractors utilize standardized procedures to assure quality and consistency in the implementation of the groundwater protection practices. Procedures for the following general programs at PGDP are maintained by BJC:

- Project Wide,
- Environment, Safety, and Health,
- Uranium Programs,
- DOE Material Storage Areas (DMSAs),
- Waste Management,
- Radiological Controls (RADCON),
- Data and Sampling, and
- Decontamination and Decommissioning (D&D).

A list of these procedures is attached as Appendix D. All current BJC procedures may also be accessed through the Internet at www.bechteljacobs.org/pad/pad.htm or by contacting BJC at (270) 441-5000. Additional task-specific procedures, maintained by the subcontractors working on the EM Program, are reviewed and approved by BJC.

The following sections provide brief descriptions of the groundwater protection practices that have been implemented at PGDP.

4.1 GROUNDWATER MONITORING

4.1.1 Resource Conservation and Recovery Act Subtitle C Monitoring

Currently, the only Resource Conservation and Recovery Act (RCRA)-permitted facility at PGDP that requires groundwater monitoring is the C-404 Low-Level Radioactive Waste Burial Ground. The C-404 unit was used as a low-level waste lagoon/burial ground from the early 1950s until 1986. At that time, routine testing determined that, of the wastes disposed there, gold dissolver precipitate was considered a hazardous waste under RCRA. The landfill was covered with a RCRA-compliant clay cap and was certified closed in 1987 as a hazardous waste landfill. A post-closure permit application was prepared and submitted to the Commonwealth of Kentucky in June 1989. The landfill is now monitored under post-closure monitoring requirements.

Twelve detection monitoring wells (MWs) were installed to monitor groundwater quality during the post-closure care period. The detection wells were installed in the UCRS and the underlying RGA, which is considered to be the uppermost regulatory aquifer. A statistical evaluation of the indicator parameters was conducted using quarterly sample results from the initial year of monitoring. As a result, the Commonwealth of Kentucky determined that additional information was needed to support the post-closure permit application. In support of further characterization of the C-404 unit, two additional MWs (MW-226 and MW-227) were subsequently installed upgradient of the unit. MW-226 and MW-227 provide monitoring of the lower RGA and the upper RGA, respectively.

In May 1996, the director of the Kentucky Division of Waste Management (KDWM) was notified of a statistically significant increase of technetium-99 (^{99}Tc) in MW-84. Monitoring was initiated for the radionuclides ^{99}Tc, uranium-234 (^{234}U), ^{235}U, and uranium-238 (^{238}U). In 1998, statistical analyses of downgradient test-well results compared with upgradient well results showed no significant increases for any analytes; therefore, the landfill was returned to detection (semiannual) monitoring status.

4.1.2 Underground Storage Tank Monitoring

Hazardous and Solid Waste Amendments (HSWA), under Subtitle I of RCRA regulation [40 Code of Federal Regulations (CFR) Part 280], established a comprehensive regulatory program for underground storage tanks (USTs). The Subtitle I regulations generally pertain to all USTs used to store "regulated substances". Regulated substances are defined as hazardous substances listed under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) regulations (40 *CFR* Part 302) and liquid petroleum products. However, RCRA-regulated wastes are specifically exempt from the Subtitle I (UST) regulations and releases from USTs that contain RCRA wastes are addressed under the regulations governing corrective action. In addition to these federal regulations, USTs at PGDP are also subject to *KAR Title 401, Chapter 42*.

During a routine sampling of wells in the proximity of the C-750 garage during July 1989, evidence of combustible vapors was discovered in a plant well. Subsequent investigations of two USTs at the C-750 garage confirmed they were leaking. These tanks were emptied of product, exploratory soil borings were completed, and a MW was installed.

A general UST investigation was initiated in 1991 that targeted the two USTs at the C-750 garage, as well as four additional USTs in the general vicinity. The intent of this investigation was to determine if any tanks not previously investigated had leaked, to identify possible contaminant migration paths, and to suggest alternatives and recommended actions for site remediation. A complete discussion

of the investigation and results is presented in the *Site Investigation of the Underground Storage Tanks at the C-200, C-710, and C-750 Buildings* (CDM 1992).

Subsequent to the completion of the UST site investigation, a risk assessment was completed to evaluate the risks to human health and the environment resulting from the leaking UST. A complete discussion of the results of the risk assessment are presented in *Baseline Risk Assessment for Exposure to Polycyclic Aromatic Hydrocarbons at Underground Storage Tanks C-750-A&B, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (KY/EM-170).

DOE is responsible for 14 of the 16 site USTs that have been reported to KDWM in accordance with regulatory notification requirements. Of DOE's 14 USTs, none are currently in use. Three of the USTs have been removed from the ground, eight have been filled in place with inert material, one was abandoned in place, and two were determined not to exist. At the end of 2000, only three of DOE's USTs had yet to meet all regulatory requirements necessary to achieve permanent ("clean") closure. The remaining two UST sites reported to KDWM are leased to and operated by USEC. Table 1 provides summary information on the USTs for which DOE is responsible. The PGDP Identification Number provided in Table 1 may be used to locate the UST sites on Drawing 1.

Table 1. Summary information on USTs.

State Identification Number	PGDP Identification Number	SWMU Designation / Status	Regulatory Status
0001	C-750-A	142 / NFA	Removed 3/91; closure complete per KDWM letter of 3/25/99.
0002	C-750-B	143 / NFA	Removed 3/91; closure complete per KDWM letter of 3/25/99.
0003	C-750-C	25 / NFA	Removed 10/93; not Subtitle I – clean closed under RCRA Subtitle C.
0004	C-750-D	24 / NFA	Rinsed with trichloroethene (TCE) and emptied 6/79; filled with cement 10/97; closure complete per KDWM letter of 11/23/99.
0005	C-746-A1	139 / NFA	Emptied 9/88; filled with cement 10/97; contaminated soils to be remediated.
0006	C-710-B	73 / NFA	EXEMPT – emptied 7/85; filled with cement 10/97; awaiting final closure approval.
0007	C-200-A	72 / NFA	EXEMPT – grouted in 1977; closure complete per KDWM letter of 11/23/99.
0008	C-746-A2	140 / NFA	During the WAG 15 Site Investigation, this UST was determined (and documented) to be non-existent.
0009	C-751-W	186 / NFA	In use. Leased to and operated by USEC.
0010	C-751-E	186 / NFA	In use. Leased to and operated by USEC.
0011	C-611-1	130 / NFA	Last used before 1975; clean closed per KDWM letter of 12/6/96.
0012	C-611-3	134 / NFA	Last used before 1975; filled with cement 9/97; clean closed per KDWM letter of 12/6/96.
0013	C-611-2	131 / NFA	This UST was determined to be non-existent – no further action required per state correspondence of 12/6/96.
0014	C-611-4	132 / NFA	Last used before 1975; filled with sand; clean closed per KDWM letter of 12/6/96.
0015	C-611-5	133 / NFA	Filled with grout before 1975; clean closed per KDWM letter of 12/6/96.
0016	C-200-B	NA	Filled with concrete around 1981; awaiting final closure approval.

NFA: No further action. These units are addressed by the Kentucky Underground Storage Tank Program.
NA: Not Applicable

4.1.3 RCRA 3004 (u/v) Monitoring

Additional groundwater monitoring to be performed by DOE relates to RCRA 3004 (u/v) and CERCLA requirements for characterization of all areas of contamination at a facility that has had releases that may contaminate groundwater. Results of this monitoring will be used to determine and implement remedial actions, as necessary, to protect human health and the environment as per RCRA/CERCLA.

4.1.4 RCRA Subtitle D Monitoring

The C-746-S Residential Landfill stopped receiving solid waste before July 1, 1995, and was certified closed October 31, 1995. The groundwater monitoring system for the C-746-S Residential Landfill also encompasses the C-746-T Inert Landfill, which was certified closed in November 1992. The C-746-T Inert Landfill has fulfilled its two years of post-closure environmental monitoring and maintenance requirements and is awaiting final closure approval from KDWM. The monitoring system for both facilities consists of 11 wells: MW-179, MWs 220-224, MWs 263-264, MWs 266-267, and MW-353. Monitoring wells are sampled quarterly for analytes dictated by a KDWM-approved solid waste landfill permit modification.

A new solid waste landfill, C-746-U, was constructed in 1996 north of C-746-S and C-746-T. The groundwater monitoring system for this facility consisted of eight wells and is described in Section 25 of the landfill's Technical Application for a solid waste landfill permit.

Five piezometers (PZs) installed to establish the presence or absence of a water table at the C-746-U Landfill were abandoned in 1997 by removing casing and screens, reaming the hole, and grouting it to the surface with high solids bentonite grout. These PZs established that a shallow water table was not present beneath the disposal cells. They were sampled to provide a baseline for TCE and ^{99}Tc.

During spring 2000, one of the C-746-S Landfill wells, MW-181, was abandoned and its casing inspected. Inspection revealed that areas of the casing's exterior had been corroded to the point that, in some locations, the integrity of the casing had been breached. In response, a video camera well inspection survey was performed on the other MWs in the vicinity to the three landfills. This survey confirmed that the stainless steel casings of MWs at the landfills were corroded. As a result of the camera survey, the KDWM has requested the abandonment of 16 MWs at the landfills and the installation of 19 new MWs. The initial task of this project was completed in fall 2000 with the abandonment of MW-265, MW-270, and MW-277 as well as further analysis of the casing corrosion. The results of this corrosion study are documented in *Results of the Monitoring Well Corrosion Study, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (CDM 2001a).

4.2 ENVIRONMENTAL SURVEILLANCE MONITORING

Groundwater surveillance monitoring, as required by DOE 5400.1, is currently being implemented at PGDP. The *Paducah Gaseous Diffusion Plant Environmental Monitoring Plan* (CDM 2000b) discusses this program; its components, including MWs; sample parameters; and sampling frequencies. As sampling requirements continue to change, the plan is maintained as a living document that will be modified to meet new requirements and needs.

4.3 KENTUCKY POLLUTANT DISCHARGE ELIMINATION SYSTEM OUTFALLS

Kentucky Pollutant Discharge Elimination System (KPDES) Permit Number KY0004049 requires PGDP to monitor effluent discharges through permitted outfalls 001, 015, 017, and 019 (Fig.7). Assessment parameters include both physical and chemical constituents. All results are assessed and submitted to the proper regulatory agencies. Activities are currently completed by BJC and include field testing (pH, conductivity, and temperature), field measurements (flow measurements), and laboratory analysis. All other outfalls located at the plant are monitored under a KPDES Permit issued to USEC.

4.4 SAMPLE COLLECTION

Surface water bodies (streams, the Ohio River, lagoons, and ponds), surface and subsurface soil, and groundwater (from MWs) are often sampled as part of the environmental assessment efforts conducted at PGDP. To provide protection of the groundwater during the performance of these activities, task specific procedures that allow quantification of site conditions without degradation of the sampling site are utilized. These procedures, maintained and implemented by subcontractors working on the EM Program, are specified and described in project-specific Sampling and Analysis Plans that are reviewed and approved by BJC prior to implementation of the procedures. In addition, the procedures utilized during sample collection tasks are documented in the associated investigation or evaluation report published following completion of the assessment. The following sections in this report provide generic information on the types of procedures that may be utilized to sample surface water, surface and subsurface soil, and groundwater at PGDP. Specific information on procedures that have been used in past assessment efforts are available in published documents such as:

- *Results of the Site Investigation, Phase I, at the Paducah Gaseous Diffusion Plant* (CH2M HILL, 1991);
- *Results of the Site Investigation, Phase II, at the Paducah Gaseous Diffusion Plant* (CH2M HILL, 1992);
- *Waste Area Grouping 6 Remedial Investigation, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 1999a);
- *Remedial Investigation Report for Waste Area Grouping 27 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 1999b);
- *Remedial Investigation Report for Waste Area Grouping 28 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 2000a); and
- *Site Evaluation Report for Waste Area Grouping 8 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 2000b).

4.4.1 Surface Water

Surface water sampling activities can be divided into three types: observation, sample extraction, and analysis. Observations include pre-sampling visual assessment and determination of flow rates or volumes using flow meters and calibrated flumes. Sample extraction protocol is designed to allow representative samples to be taken from a location and protect sampling personnel while preventing the spread of contamination. Collected samples are then tested for specific constituents using either field measurement methods or laboratory analysis.

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The following types of procedures may be utilized during surface water sampling as appropriate to the requirement of the specific task:

- Collection of surface water samples,
- Field measurement of water temperature,
- Field measurement of pH,
- Field measurement of dissolved oxygen,
- Field measurement of residual chlorine,
- Field measurement of the oxidation/reduction potential of water,
- Field measurement of specific conductance, and
- Field measurement of hexavalent chromium.

4.4.2 Surface and Subsurface Soil

Surface and subsurface soil samples are taken prior to or during construction activities, excavating, or as part of environmental characterization activities. Procedures utilized during soil sampling enable characterization while protecting sampling personnel and reducing the risk of increasing contaminant migration.

The following types of procedures may be utilized during surface and subsurface soil sampling as appropriate to the requirement of the specific task:

- Surface soil sampling,
- Subsurface soil sampling,
- Soil gas sampling, and
- Lithologic logging.

4.4.3 Well Sampling

Numerous DOE MWs, private MWs, and residential wells are sampled on a regular basis (Appendix E). This sampling is conducted in order to monitor the existing groundwater contamination plume and detect any additional releases of contamination into the RGA. The procedures that guide these activities help ensure that analytical results duplicate approximate aquifer conditions. In addition to chemical and physical conditions, aquifer parameters such as transmissivity and conductivity are determined as needed using pumping and slug tests. Prior to such activities, specific permission is acquired from the proper Commonwealth of Kentucky authorities. Additional information on the well sampling program at PGDP is available in the *Paducah Gaseous Diffusion Plant Environmental Monitoring Plan* (CDM 2000b)

The following types of procedures may be utilized during well sampling as appropriate to the requirement of the specific task:

- Groundwater sampling,
- Water level measurements,
- Monitoring well purging, and
- Groundwater monitoring section sampling.

4.5 SUBSURFACE PENETRATIONS

In an effort to characterize subsurface conditions, numerous subsoil penetrations have been made. These have been in the form of MWs, production/extraction wells, PZs, and sample borings (including direct push holes and borings to the McNairy Formation and deeper). DOE's subsurface penetrations are designed to accurately reflect the parameters of the aquifer zone selected. Installation/drilling techniques are selected specifically to prevent undesirable alteration of contaminant migration while providing the maximum information required for characterization of the geological and hydrogeological conditions. Sample borings drilled and MWs no longer required for sampling are properly abandoned to prevent downward migration of contaminants.

4.6 WASTE MANAGEMENT

Due to the magnitude of its investigation and remediation efforts, DOE generates, handles, and stores a significant quantity of waste materials. Activities that deal with waste materials produced from DOE actions are addressed in procedures established to ensure proper storage, maintain accountability, and eliminate the possibility of a release to the environment. At each area of generation, facilities are provided for the proper containerization of waste materials.

Waste handling activities include segregation, transportation, sampling, storage, and treatment or disposal. Beginning at the moment of generation, waste materials are segregated (i.e., liquid from solid) and similar materials are consolidated in containers. This step ensures proper storage and handling until the moment of disposal or treatment. After waste materials are containerized and secured, they are transported to one of DOE's waste staging or storage areas for further processing, transferral to another container, or to await treatment and/or disposal.

4.7 DMSAs

On July 1, 1993, the DOE leased the operations facilities at PGDP to USEC. As part of this process, DOE agreed that it would gradually withdraw from its role as regulator for the enrichment operations and that the Nuclear Regulatory Commission (NRC) would assume those responsibilities. Prior to final transition to NRC regulation on January 1, 1997, a number of areas within the USEC-leased space were identified as containing surplus equipment, parts, materials, and low-level radioactive and polychlorinated biphenyl wastes associated with DOE's past operation of the plant. The materials present within these zones raised regulatory issues that could prevent the NRC from certifying USEC's continued operation of PGDP. DOE agreed to take back the leasehold for these DMSA areas and reassume responsibility and authority for management of the materials. As part of this agreement, DOE required USEC to produce an inventory of all materials located within the DMSAs.

Preliminary efforts have categorized the DMSAs as Phase 1 (items expected to have no fissionable material, but not fully characterized), Phase 2 (items possibly containing fissionable material), and Phase 3 (items characterized for storage, containing no fissionable materials); however, the inventory and identification of all materials in the DMSAs has not yet been fully confirmed or completed. Maps depicting the locations of individual DMSAs are presented in Appendix F.

On September 5, 2000, the Kentucky Department for Environmental Protection issued a Notice of Violation (NOV) to DOE for failure to comply with regulatory requirements regarding solid and hazardous waste and for failure to comply with conditions of the PGDP Hazardous Waste Permit. As a remedial measure, the NOV required the submittal of a work plan to fully address the characterization of

all wastes managed in the DMSAs. In response, the *Paducah Gaseous Diffusion Plant Department of Energy Material Storage Area Characterization/Remediation Plan, Paducah, Kentucky* (DOE 2000c) was issued in December 2000.

4.8 MATERIAL TRANSFERS OFF-SITE

A transportation plan is prepared for all material to be shipped off-site. This plan describes the process to ensure compliance with applicable U.S. Department of Transportation Hazardous Material Regulations. A hazard classification is assigned to all waste being shipped in accordance with *49 CFR 172.101* and *49 CFR 173.2a*. Waste is containerized in accordance with *49 CFR 172.101, Hazardous Material Table,* and *49 CFR 173*. Radiation levels are not allowed to exceed the threshold values provided in *49 CFR 173.441, Radiation Levels,* and *49 CFR 173.443, Contamination Controls*. Shipping papers are prepared for each shipment in accordance with *49 CFR 172.200* and/or *40 CFR 262*. Additional information/shipping papers are provided to comply with applicable requirements of the NRC, National Emission Standards for Hazardous Air Pollutants, and Toxic Substance Control Act. All marking, labeling, and placarding of waste materials and waste containers are completed in accordance with *40 CFR 172.300*, *49 CFR 172.400*, and *49 CFR 172.500*, respectively. An Emergency Response Plan is completed and provided for the carrier to use to comply with *49 CFR 171.15*, *49 CFR 171.16*, and *49 CFR 390.15*.

4.9 TREATMENT

PGDP currently operates two groundwater pump-and-treat systems, an air stripper, ion exchange, and a vapor phase activated carbon exchange unit (Northwest Plume), and a cooling tower/steam stripper (Northeast Plume). The groundwater pump-and-treat systems are located northwest and northeast of PGDP, respectively.

The groundwater pump-and-treat systems were constructed and are operated in accordance with two separate CERCLA Interim Record of Decisions (RODs) approved by the U.S. Environmental Protection Agency (EPA). These RODS are the *Record of Decision for Interim Remedial Action of the Northwest Plume at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 1993) and the *Record of Decision for Interim Remedial Action at the Northeast Plume, Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 1995). The purpose of these facilities is to retard further migration of the northwest and northeast groundwater contaminant plumes. Prior to the implementation of the interim RODs, a water policy was established for residences located within the affected areas. This policy was established in the Area of Concern between DOE and EPA as required under Sections 104 and 106 of the CERCLA.

In July 1998, DOE issued the CERCLA *Record of Decision for Remedial Action at Solid Waste Management Unit 91 of Waste Area Group 27 at the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 1998). This ROD designated Lasagna™ as the selected remedial alternative for reducing the concentration of TCE in SWMU 91 to levels that would decrease the potential groundwater risk to human health and the environment at the point-of-exposure. Installed on the south side of the C-745-B cylinder yard in 1999, the electro-osmosis system will be operated for two years in an attempt to reduce the concentration of TCE in SWMU 91 soil from an average of 84 mg/kg to an average of less than 5.6 mg/kg. Additional information about the Lasagna™ technology and its development can be found in the *Final Soil Characterization Work Plan for the Paducah Gaseous Diffusion Plant Lasagna Pilot Test in the Cylinder Drop Test Area, Paducah, Kentucky* (MMES 1994) and the *DNAPL Site Characterization*

and Lasagna™ Technology Demonstration At Solid Waste Management Unit 91 of the Paducah Gaseous Diffusion Plant, Paducah, Kentucky (LMES 1996).

4.10 D&D

Two major facilities at PGDP have been accepted for D&D. These facilities are the C-340 Metal Reduction Plant complex, where UF_6 was converted to uranium metal and hydrogen fluoride, and the C-410 Feed Plant complex, where uranium trioxide (UO_3) was converted to UF_6. Activities performed to date include surveillance and maintenance of the structures to ensure containment of residual materials, D&D project planning for future implementation and planning, and planning for the additional removal and sale of surplus fluorine-generating equipment to private industry.

4.11 RELEASE PREVENTION

One of the first steps in preventing groundwater contamination is release prevention. To this end, DOE operates under DOE Order 435.1, *Radioactive Waste Management* (DOE 1999c), which directs the acceptable conditions for treatment, storage, and disposal of DOE generated waste. In addition, each project task is required to have a Waste Management Plan which specifically relates to the expected waste stream, the quantities of waste generated, and also includes, but is not limited to, information on required container inspection, diking, repackaging of waste, and transferring of liquid wastes.

4.12 RELEASE CONTROL

Because the potential for release to the environment exists at all facilities that handle hazardous waste, DOE has developed and continues to update the *Spill Prevention Control and Countermeasure Plan* (CDM 2001b). This "living" document stipulates the procedures to be followed and the equipment to be used in the event of a liquid release. It also maintains a record of these releases.

5. TRAINING

DOE ensures that both EM personnel and all supporting contractor personnel are trained and qualified for their functional positions. This training complies with all state and federal regulations; DOE Orders; BJC policies and procedures; and BJC site-specific requirements. This training ensures that all employees implement proper practices for protection of the environment, including groundwater protection. Applicable training courses include:

- **General Employee Training (GET), General Employee Radiological Training (GERT), and General Nuclear Criticality Safety Training** - This six hour session covers general topics for performing work at a DOE facility operated by BJC, including the Quality Assurance Program, classification security, the Industrial Hygiene Program, emergency preparedness, fire protection, Radiological Program, criticality safety, and hazard communication. Personnel who require access to PGDP, except escorted visitors, must complete this course. Testing is required to complete the course and it must be renewed every two years.

- **GET-Hazard Communication** –Personnel who require access to PGDP, except escorted visitors, for more than 10 working days in a 12-month period must complete this course. The training module, which is taught in conjunction with the GET basic training (discussed in the previous paragraph), covers chemical hazard communication standards and the BJC Hazard Communication Program. This module must be re-certified every two years.

- **Radiation Worker Training II** – The PGDP Radiation Worker Training is required for all unescorted personnel who work in, or require access to, radiological areas. Radiological areas include, but are not limited to, regulated areas, high contamination areas, very high contamination areas, high radiation areas, very high radiation areas, airborne areas, and respirator areas. In addition, all workers who are determined by the PGDP Health Physics Division to be occupationally exposed to radiation are required to complete this training. Both PGDP GET and GERT training courses must be completed before taking this course. This training requires 16 hours to complete and must be re-certified every two years.

- **Waste Generator Training** – This four-hour course is required for personnel who generate, package, and handle RCRA-hazardous waste, including personnel who work in areas that generate hazardous waste and who manage satellite or 90-day accumulation areas. This training gives instruction on the proper management and temporary storage of wastes generated during the performance of hazardous waste activities at PGDP. The course must be renewed every two years.

- **Occupational Safety and Health Association 1910.120 Hazardous Waste Training** – A 24- or 40-hour course is required for personnel who work with hazardous waste. The differences in training depend on the activities as specified in the regulations.

6. REGULATORY BACKGROUND

Due to the federal ownership of the facility and the variety of known and suspected areas of contamination, the regulatory requirements and agreements that guide environmental remediation activities are rather lengthy and are frequently modified. A list of applicable requirements can be found in the *Paducah Site Annual Site Environmental Report for 1999* (DOE 2000d) or the *Site Management Plan for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky* (DOE 2001). These documents are available upon request from the Environmental Information Center in Kevil, Kentucky.

Groundwater-specific requirements are listed in the *Paducah Gaseous Diffusion Plant Groundwater Protection Management Program* (CDM 2000a). This document is updated semiannually to reflect changes in findings or regulatory modifications.

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PROFESSIONAL GEOLOGIST AUTHORIZATION

DOCUMENT IDENTIFICATION: Groundwater Protection Plan for the Paducah Gaseous Diffusion Plant, Paducah, Kentucky

Stamped and signed pursuant to my authority as a duly registered geologist under the provisions of Kentucky Revised Statute Chapter 322A.

Gilbert R. Miller PG0334 8-1-01

Gilbert R. Miller | PG0334 | Date

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APPENDIX A

DEPARTMENT OF ENERGY FACILITIES AND AREAS

Department of Energy Facilities and Areas

NOTE: Acronyms are defined on Page A-13

Name	Location (Plant Grid/Off-Site)	Operational Status	SWMU/WAG Designation if applicable	Surface Drainage	Monitoring (Surface)
C-100 Trailer Complex Soil Contamination (East Side)	D-6	Inactive	166/20	KPDES Outfall	KPDES Outfall
C-103 DOE Office Building	D-7	Active	NA	KPDES Outfall/ BC	KPDES Outfall
C-200 (USTs)	D-5	Inactive	72/4	KPDES Outfall	KPDES Outfall
C-204 Disintegrator Building (Shredder)	D-7	Active	479	KPDES Outfall	KPDES Outfall
C-218-A Outdoor Firing Range (PGDP)	B-5	Inactive	181/21	BC	KPDES Outfall
C-218-B Outdoor Firing Range (WKWMA)	Off-Site	Inactive	180/21	BC	BC Sampling
C-301 Fire Training/Storage Building	E-4	Inactive	223	KPDES Outfall	BC Sampling
C-301 Storage Building	E-4	NA	100/1	KPDES Outfall	KPDES Outfall
C-310 PCB Soil Contamination (West Side)	D-5	Inactive	156/19	KPDES Outfall	KPDES Outfall
C-331 PCB Soil Contamination (Southeast Side)	E-5	Inactive	154/19	KPDES Outfall	KPDES Outfall
C-331 PCB Soil Contamination (West Side)	E-5	Inactive	153/19	KPDES Outfall	KPDES Outfall
C-331 RCW Leak (East Side)	E-5	Inactive	177/21	KPDES Outfall	KPDES Outfall
C-331 RCW Leak (Northwest Side)	E-5	Inactive	176/21	KPDES Outfall	KPDES Outfall
C-333 PCB Soil Contamination (North Side)	E-5	Inactive	135/16	KPDES Outfall	KPDES Outfall
C-333 PCB Soil Contamination (West Side)	E-6	Inactive	155/19	KPDES Outfall	KPDES Outfall
C-333 PCB Waste Staging Area	E-6	Active	37	KPDES Outfall	KPDES Outfall
C-333-A Sewage Treatment Aeration Tank	E-6	Active	191	KPDES Outfall	KPDES Outfall
C-337-A Sewage Treatment Aeration Tank	E-3	Active	190/D-13	KPDES Outfall	KPDES Outfall
C-340 Complex (A-Powder Bldg., B-Metals Bldg., C-Slab Bldg., D-Magnesium Storage Bldg., and E-Emergency Power for Critical Alarms)	E-5	Inactive	477	KPDES Outfall	KPDES Outfall
C-340 Hydraulic System	E-5	Inactive	101/5	KPDES Outfall	KPDES Outfall

DOE Facilities and Areas (Continued)

Name	Location (Plant Grid/ Off-Site)	Operational Status	SWMU/WAG Destination if applicable	Surface Drainage	Monitoring (Surface)
C-401 Transfer Line/Neutralizing System	D-3	Inactive	26/14	KPDES Outfall	KPDES Outfall
C-402 Lime House	D-4	Inactive	480	KPDES Outfall	KPDES Outfall
C-403 Neutralizing Pit	D-4	Inactive	40/6	NA	Pre-Discharge/ KPDES Outfall
C-404 Low-Level Radioactive Waste Burial Ground	C-3	RCRA Closure	3/22	KPDES Outfall	NA
C-405 Incinerator	D-4	Inactive	55/11	KPDES Outfall	KPDES Outfall
C-410-A Hydrogen Holder	D-4	Inactive	481	KPDES Outfall	KPDES Outfall
C-410-B Sludge Lagoon	D-4	Inactive	19/11	KPDES Outfall	KPDES Outfall
C-410-C Hydrofluoric Acid Neutralization Building	D-4	Inactive	41/11	KPDES Outfall	KPDES Outfall
C-410-D Area Soil Contamination	D-4	Inactive	198/20	KPDES Outfall	KPDES Outfall
C-410-E Hydrofluoric Acid Emergency Holding Pond	D-4	Inactive	20/10	KPDES Outfall	KPDES Outfall
C-410-E Hydrofluoric Acid Vent Surge Protection Tank	D-4	Inactive	169/16	KPDES Outfall	KPDES Outfall
C-410-F, G, H Hydrofluoric Acid Storage Buildings	D-4	Inactive	478	KPDES Outfall	KPDES Outfall
C-410-I Ash Receiver Shelter	D-4	Inactive	478	KPDES Outfall	KPDES Outfall
C-410-J Hydrofluoric Acid Storage Building (East)	D-4	Inactive	478	KPDES Outfall	KPDES Outfall
C-411 Cell Maintenance Building	D-4	Inactive	D&D	KPDES Outfall	KPDES Outfall
C-415 Feed Plant Storage Building	D-4	Inactive	482	KPDES Outfall	KPDES Outfall
C-416 Equipment Cleaning Facility	E-4	Inactive	Future D&D	KPDES Outfall	KPDES Outfall
C-420 PCB Spill Site	D-4	Inactive	78/6	KPDES Outfall	
C-420 UF_4 Greensalt Plant	D-4	Inactive	478	KPDES Outfall	KPDES Outfall
C-540 PCB Spill Site	E-5	Inactive	80/23	KPDES Outfall	KPDES Outfall

DOE Facilities and Areas (Continued)

Name	Location (Plant Grid/ Off-Site)	Operational Status	SWMU/WAG Destination if applicable	Surface Drainage	Monitoring (Surface)
C-733 Hazardous Waste Storage Area	C-4	Active	44	KPDES Outfall	Pre-Discharge/ KPDES Outfall
C-743 Trailers 6, 7, 8, and 11–16 (East)	C-5	Active	NA	KPDES Outfall	KPDES Outfall
C-745 Cylinder Yard Spoils Area-PCB Soil Contamination	L-12	Inactive	160/19	KPDES Outfall	KPDES Outfall
C-745-C Cylinder Yard	C-3	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-D Cylinder Yard	E-8	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-E Kellogg Building Site	F-14	Inactive	99/5	KPDES Outfall	KPDES Outfall
C-745-F Cylinder Yard	D-7	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-G Cylinder Yard	E-7	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-K Cylinder Yard	D-7	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-L Cylinder Yard	E-7	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-M Cylinder Yard	D-8	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-N Cylinder Yard	E-8	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-P Cylinder Yard	E-8	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall
C-745-S Cylinder Yard	D-8	Active	Low-Level Radiologic Materials Storage	KPDES Outfall	KPDES Outfall

DOE Facilities and Areas (Continued)

Name	Location (Plant Grid/ Off-Site)	Operational Status	SWMU/WAG Destination if applicable	Surface Drainage	Monitoring (Surface)
C-746-P, P1 Scrap Metal Yards	C-2	Active	13/3	KPDES Outfall	KPDES Outfall
C-746-Q Hazardous and Low-Level Waste Storage Building	E-7	Active	Permitted 46	KPDES Outfall	KPDES Outfall
C-746-R Waste Storage Area	D-7	Active	45	KPDES Outfall	KPDES Outfall
C-746-S Residential Landfill	Off-Site	Active	9	LBC	LBC Sampling
C-746-S1, C-746-S2, C-746-S3, and C-746-S4	Off-Site	Active	NA	LBC	NA
C-746-T Inert Landfill	Off-Site	Inactive	10	LBC	LBC Sampling
C-746-U Contained Landfill	Off-Site	Active	208	LBC	LBC Sampling
C-746-V ER Storage Pad	D-3	Active	470	KPDES Outfall	KPDES Outfall
C-747-C Oil Landfarm	C-4	Inactive	1/23	KPDES Outfall	KPDES Outfall
C-747-B Burial Area	C-2	Inactive	6/3	KPDES Outfall	KPDES Outfall
C-747-A Burn and Burial Area	C-2	Inactive	30/7/22	KPDES Outfall	KPDES Outfall
C-747-A UF_4 Drum Yard	C-2	Inactive	12/24	KPDES Outfall	KPDES Outfall
C-747 & C-748 Burial Area	C-2	Inactive	4/2	KPDES Outfall	KPDES Outfall
C-748-A Inactive KOW Disposal Area	C-6	Inactive	95/1	BC	BC Sampling
C-749 Uranium Burial Ground	C-3	Inactive	2/22	KPDES Outfall	KPDES Outfall
C-750-A UST (Gasoline)	D-5	Inactive	142/4	KPDES Outfall	KPDES Outfall
C-750-B UST (Diesel)	D-5	Inactive	143/4	KPDES Outfall	KPDES Outfall
C-750-D UST	D-5	Inactive	24/9	KPDES Outfall	KPDES Outfall
C-750 UST (Waste Oil)	D-5	Inactive	25	KPDES Outfall	KPDES Outfall
C-752 RA Waste Holding Facility	D-3	Active	NA	KPDES Outfall	KPDES Outfall

DOE Facilities and Areas (Continued)

Name	Location (Plant Grid/ Off-Site)	Operational Status	SWMU/WAG Destination if applicable	Surface Drainage	Monitoring (Surface)
Concrete Rubble Pile	Off-Site	Inactive	197/17	BC	NA
Concrete Rubble Pile	Off-Site	Inactive	146/17	NA	NA
Concrete Rubble Pile	Off-Site	Inactive	147/17	NA	NA
Concrete Rubble Pile	Off-Site	Inactive	148/17	NA	NA
Concrete Rubble Pile	Off-Site	Inactive	149/17	NA	NA
Concrete Rubble Pile	Off-Site	Inactive	150/17	NA	NA
Concrete Rubble Pile	Off-Site	Inactive	151/17	NA	NA
Concrete Rubble Pile	Off-Site	Inactive	152/17	NA	NA
Concrete Rubble Pile	B-7	Inactive	184/17	BC	NA
Creek (Bayou)	B-5	Active	65/25	BC	KPDES Outfall
Creek (Bayou) Monitoring System	Off-Site	Inactive	199	BC	BC Sampling
Creek (Little Bayou)	Off-Site	Active	64/25	LBC	KPDES Outfall
Cylinder Drop Test Area (UF_6)	C-4	Inactive	91/6	KPDES Outfall	KPDES Outfall
Fill Area for Dirt From C-420 PCB Spill Site	D-4	Inactive	92/10	KPDES Outfall	KPDES Outfall
KOW Standpipe	B-12	Inactive	182	BC	NA
KOW Toluene Spill Area	Off-Site	Inactive	157/7	BC	NA
KOW Trickling Filter and Leach Field	Off-Site	Inactive	94/1	BC	NA
McGraw Construction Facilities (South Side, Cylinder Yards, Inside Security Fence)	E-8	Inactive	193/15	KPDES Outfall	KPDES Outfall

DOE Facilities and Areas (Continued)

Name	Location (Plant Grid/ Off-Site)	Operational Status	SWMU/WAG Destination if applicable	Surface Drainage	Monitoring (Surface)
Concrete Rubble Pile	B-4	Inactive	129/17	KPDES Outfall	NA
McGraw Construction Facilities (South Side, Outside Security Fence)	D-8	Inactive	194/15	KPDES Outfall	KPDES Outfall
McGraw UST	E-8	Inactive	183	KPDES Outfall	KPDES Outfall
Residential/Inert (Spoils) Area	Off Site	Inactive	145	LBC	LBC Sampling
Soil Contamination Site 1	D-4	Inactive	NA	KPDES Outfall	KPDES Outfall
Soil Spoils Area	C-6	Inactive	195/10	KPDES Outfall	KPDES Outfall

Acronyms

BC	Bayou Creek
D&D	Decontamination and Decommissioning
ER	Environmental Restoration
H_2SO_4	Sulfuric Acid
KOW	Kentucky Ordnance Works
KPDES	Kentucky Pollutant Discharge Elimination System
LBC	Little Bayou Creek
NA	Not Applicable
NaOH	Sodium Hydroxide
PCB	polychlorinated biphenyl
PGDP	Paducah Gaseous Diffusion Plant
RCW	Recirculating Cooling Water
RCRA	Resource Conservation and Recovery Act
SWMU	solid waste management unit
^{99}Tc	Technetium-99
TCE	trichloroethene
TSCA	Toxic Substances Control Act of 1976
UF_4	uranium tetraflouride
UF_6	uranium hexafluoride
UST	underground storage tank
WAG	waste area group
WKWMA	West Kentucky Wildlife Management Area

APPENDIX B

SOLID WASTE MANAGEMET UNIT DESIGNATIONS

SOLID WASTE MANAGEMENT UNIT DESCRIPTIONS

Note: Acronyms are defined on Page B-7

SWMU	DESCRIPTION	SWMU	DESCRIPTION
1	C-747-C Oil Landfarm	51	C-400-D Lime Precipitation Unit **
2	C-749 Uranium Burial Ground	52	C-400 Waste Decontamination Solution Storage Tanks **
3	C-404 Low-Level Radioactive Waste Burial Ground *	53	C-400 NaOH Precipitation Unit **
4	C-747 Contaminated Burial Ground	54	C-400 Degreaser Solvent Recovery Unit **
5	C-746-F Classified Burial Ground	55	C-405 Incinerator
6	C-747-B Burial Ground	56	C-540-A PCB Waste Staging Area
7	C-747-A Burial Ground	57	C-541-A PCB Waste Staging Area
8	C-746-K Landfill	58	N-S Diversion Ditch (Outside Plant Security Fence)
9	C-746-S Residential Landfill **	59	N-S Diversion Ditch (Inside Plant Security Fence)
10	C-746-T Inert Landfill **	60	C-375-E2 Effluent Ditch (KPDES 002)
11	C-400 Trichlorethylene Leak Site	61	C-375-E5 Effluent Ditch (KPDES 013)
12	C-747-A UF_4 Drum Yard	62	C-375-S6 Southwest Ditch (KPDES 009)
13	C-746-P Clean Scrap Yard	63	C-375-W7 Oil Skimmer Ditch (KPDES 008)
14	C-746-E Contaminated Scrap Yard	64	Little Bayou Creek
15	C-746-C Scrap Yard	65	Bayou Creek
16	C-746-D Classified Scrap Yard	66	C-375-E3 Effluent Ditch (KPDES 010 Ditch)
17	C-616-E Sludge Lagoon	67	C-375-E4 Effluent Ditch (KPDES 011)
18	C-616-F Full Flow Lagoon	68	C-375-W8 Effluent Ditch (KPDES 015)
19	C-410-B Hydrofluoric Acid Neutralization Lagoon	69	C-375-W9 Effluent Ditch (KPDES 001)
20	C-410-E Hydrofluoric Acid Emergency Lagoon	70	C-333-A Vaporizer
21	C-611-W Sludge Lagoon	71	C-337-A Vaporizer
22	C-611-Y Overflow Lagoon	72	C-200 UST **
23	C-611-V Lagoon	73	C-710 UST **
24	C-750-D Underground Storage Tank	74	C-340 PCB Transformer Spill Site
25	C-750 1000-Gallon Waste Oil Tank**	75	C-633 PCB Spill Site
26	C-400 to C-404 Underground Transfer Line	76	C-632-B Sulfuric Acid Storage Tank
27	C-722 Acid Neutralization Tank	77	C-634-B Sulfuric Acid Storage Tank
28	C-712 Acid Neutralization Tank	78	C-420 PCB Spill Site
29	C-746-B TRU Storage Area **	79	C-611 PCB Spill Site
30	C-747-A Burn Area	80	C-540-A PCB Spill Site
31	C-720 Compressor Pit Water Storage Tank	81	C-541 PCB Spill Site
32	C-728 Clean Waste Oil Tank	82	C-531 Electric Switchyard
33	C-728 Motor Cleaning Facility	83	C-533 Electric Switchyard
34	C-746-M PCB Waste Storage Area **	84	C-535 Switchyard
35	C-337 PCB Waste Storage Area Unit 2 **	85	C-537 Switchyard
36	C-337 PCB Waste Storage Area Unit 6 **	86	C-631 Pumphouse and Cooling Tower
37	C-333 PCB Waste Storage Area **	87	C-633 Pumphouse and Cooling Tower
38	C-615 Sewage Treatment Plant	88	C-635 Pumphouse and Cooling Tower
39	C-746-B PCB Waste Storage Area **	89	C-637 Pumphouse and Cooling Tower
40	C-403 Neutralization Tank	90	C-720 Underground Petroleum Naphtha Pipe **
41	C-410-C Neutralization Tank	91	UF_6 Cylinder Drop Test Area
42	C-616 Chromate Reduction Facility	92	Fill Area for Dirt from the C-420 PCB Site
43	C-746-B Waste Chemical Storage Area *	93	Concrete Rubble Pile
44	C-733 Hazardous Waste Storage Area *	94	KOW Trickling Filter and Leach Field
45	C-746-R Waste Solvent Storage Area *	95	KOW Burn Area
46	C-409 Hazardous Waste Pilot Plant *	96	C-333 Cooling Tower Scrap Wood Pile **
46A	C-746-Q Hazardous and Low-Level Mixed Waste Storage Building *	97	C-601 Diesel Spill
47	C-400 Technetium Storage Tank Area	98	C-400 Basement Sump
48	C-400-A Gold Dissolver Storage Tank **	99	C-745 Kellogg Building Site
49	C-400-B Waste Solutions Storage Tank *	100	Fire Training Area
50	C-400-C Nickel Stripper Evaporation Tank *	101	C-340 Hydraulic System

SOLID WASTE MANAGEMENT UNIT DESCRIPTIONS

SWMU	DESCRIPTION	SWMU	DESCRIPTION
200	Soil Contamination Southwest of TSCA Waste Storage Facility	253	C-331-22 DMSA—N-7
201	Northwest Groundwater Contamination Plume	254	C-331-23 DMSA—R-7
202	Northeast Groundwater Contamination Plume	255	C-331-24 DMSA—S-11
203	C-400 Sump	256	C-333-01 DMSA—Y-2
204	Dyke Road Historical Staging Area	257	C-333-02 DMSA—X-18
205	Eastern Portion of Yellow Water Line	258	C-333-03 DMSA—V-18
206	C-753-A TSCA Waste Storage Building **	259	C-333-04 DMSA—Sb-18
207	C-752-A ER Waste Storage Building **	260	C-333-05 DMSA—R-18
208	C-746-U Landfill **	261	C-333-06 DMSA—P-18
209	C-720 Compressor Shop Pit Sump	262	C-333-07 DMSA—Ua-26
210	Southwest Plume	263	C-333-08 DMSA—Qb-32
211	C-720 TCE Spill Site	264	C-333-09 DMSA—P-32
212	C-745-A Radiological Contamination Area	265	C-333-10 DMSA—Qb-34
213	OS-02 DMSA—North of C-745-A	266	C-333-11 DMSA—X-34
214	OS-03 DMSA–C-611	267	C-333-12 DMSA—Ub-42
215	OS-04 DMSA—West of C-746 Trailer Complex	268	C-333-13 DMSA—Na-39
216	OS-05 DMSA—North of C-206	269	C-333-14 DMSA—P-42
217	OS-06 DMSA—C-740	270	C-333-15 DMSA—N-42
218	OS-07 DMSA—West of C-741	271	C-333-16 DMSA—X-47
219	OS-08 DMSA—C-728	273	C-333-17 DMSA—N-46
220	OS-09 DMSA—South of C-409	274	C-333-18 DMSA—X-48
221	OS-10 DMSA—West of C-335	275	C-333-19 DMSA—Wa-48
222	OS-11 DMSA—Northeast of C-410	276	C-333-20 DMSA—V-48
223	OS-12 DMSA—C-301	277	C-333-21 DMSA—T-48
224	OS-13 DMSA—South of C-340	278	C-333-22 DMSA—Sa-48
225	OS-14 DMSA—South of C-533-1	279	C-333-23 DMSA—P-48
226	OS-15 DMSA—North of C-745-B	280	C-333-24 DMSA—Cb-8
227	OS-16 DMSA—South of C-746-B	281	C-333-25 DMSA—F-17
228	OS-17 DMSA—West of C-747-B	282	C-333-26 DMSA—E-18
229	OS-18 DMSA—North of C-746-F	283	C-333-27 DMSA—Lb-24
230	C-310A-01 DMSA—C-310	284	C-333-28 DMSA—J-24
231	C-310-02 DMSA—E12-14F 12-14	285	C-333-29 DMSA—Ga-24
232	C-310-03 DMSA—E18-19F 18-19	286	C-333-30 DMSA—Ea-24
233	C-310-04 DMSA—B 17-18	287	C-333-31 DMSA—Ja-31
234	C-310-05 DMSA—A 17-18	288	C-333-34 DMSA—M-42
235	C-331-01 DMSA—C-1	289	C-333-35 DMSA—Cb-40
236	C-331-02 DMSA—J-7	290	C-333-37 DMSA—M-48
237	C-331-03 DMSA—C-31	291	C-333-38 DMSA—Lb-47
238	C-331-04 DMSA—C-33	292	C-333-39 DMSA—La-48
239	C-331-05 DMSA—F32	293	C-333-40 DMSA—Ja-48
240	C-331-06 DMSA—K-33	294	C-333-41 DMSA—H-48
241	C-331-07 DMSA—P-9	295	C-333-42 DMSA—Gb-47
242	C-331-08 DMSA—T-7	296	C-333-43 DMSA—Ga-49
243	C-331-09 DMSA—S-9	297	C-335-01 DMSA—Z-3
244	C-331-10 DMSA—Y-2	298	C-335-02 DMSA—B-30
245	C-331-11 DMSA—W-7	299	C-335-03 DMSA—C-31 (excluding drums)
246	C-331-12 DMSA—Z-7	300	C-335-04 DMSA—C-33
247	C-331-13 DMSA—X-9	301	C-335-05 DMSA—F-33
248	C-331-14 DMSA—W-25	302	C-335-06 DMSA—M-34
249	C-331-15 DMSA—N-31	303	C-335-07 DMSA—Q-34
250	C-331-16 DMSA—AA-26	304	C-335-08 DMSA—T-33
251	C-331-19 DMSA—BB-30	305	C-335-09 DMSA—F-27
252	C-331-20 DMSA—DD-27	306	C-335-11 DMSA—BB-30

SOLID WASTE MANAGEMENT UNIT DESCRIPTIONS

SWMU	DESCRIPTION	SWMU	DESCRIPTION
415	G-746-S-01	458	S-755-T-2-3-01
416	G-746-X-01	459	S-755-T-3-1-01
417	G-746-X-01	460	S-755-T-3-2-01
418	G-748-B-01	461	S-755-T-3-2-02
419	G-752-C-01	462	S-755-T-3-2-03
420	G-752-C-02	463	C-746-A East-end smelter
421	G-754-01	464	C-746-A West-end smelter
422	G-755-A-01	465	G Yard Rubble Pile
423	G-755-C-01	466	South of Dykes Road, Pond Area
424	G-755-T-07-01	467	WKWMA on KOW
425	G-755-T-08	468	Area West of Plant, North of Outfall 15
426	G-755-T-2-3-01	469	C-745-J
427	G-755-T-3-1-01	470	West of C-752-A
428	G-755-T-3-2-01	471	South Area outside of C-746-B
429	S-310-04	472	West of C-746-B
431	S-333-12	473	West of C-746-B
432	S-335-09	474	West of Vortec Site
433	S-337-11	475	C-745-G5 Paint Enclosure GSA
434	S-340-01	476	Concrete Crusher
435	S-409-100	477	C-340 Metals Plant
436	S-409-20	478	C-410/420 Feed Plant
437	S-409-40	479	C-204 Disintegrator Building
438	S-409-60	480	C-402 Lime House
439	S-409-80	481	C-410-A Hydrogen Cylinder
440	S-410-05	482	C-415 Feed Plant Storage Building
441	S-540-A-2-01	483	Nitrogen-Generating Facilities: C-603-A Nitrogen Manifold Building C-603-B Nitrogen Storage Tank C-603-C Nitrogen Receiver C-603-D Nitrogen Receiver C-603-H Nitrogen Generator Control House C-603-I Nitrogen Generator Tower Area
442	S-612-01		
443	S-709-01		
444	S-709-02		
445	S-710-05		
446	S-710-06		
447	S-710-09		
448	S-710-16	484	C-611-M North Sanitary Water Storage
449	S-710-18	485	C-611-N North Sanitary Water Storage
450	S-710-32	486	Rubble Pile
451	S-710-41	487	Rubble Plie
452	S-710-44	488	AOC-PCB Contamination Area by C-410 TrailerCcomple
453	S-710-46		
454	S-743-T-17-01		
455	S-755-T-16-01		
456	S-755-T-16-02		
457	S-755-T-16-03		

* Regulated by the RCRA Permit
** No Further Action

Acronyms

DMSA	DOE Material Storage Area
ER	Environmental Restoration
KOW	Kentucky Ordnance Works
KPDES	Kentucky Pollutant Discharge Elimination System
NaOH	sodium hydroxide
PCB	polychlorinated biphenyl
PGDP	Paducah Gaseous Diffusion Plant
RCRA	Resource Conservation and Recovery Act
RCW	recirculating cooling water
TCE	trichloroethene
TRU	transuranic
TSCA	Toxic Substances Control Act of 1976
UF_4	uranium tetrafluoride
UST	underground storage tank
WKWMA	West Kentucky Wildlife Management Area

APPENDIX C

INDEX OF ENGINEER DRAWINGS

INDEX OF ENGINEER DRAWINGS

Building	Drawing No.	Title	Date	Architect Engineer
C-340	2-C	Outside Underground Services: Storm Drains, Sanitary Sewers, Water		Giffels & Vallet, Inc.
	3-C	Outside Underground Services		
	4-C	Outside Underground Services Profiles	12/27/56	
	6-C	Paving, Grading, Walks: Detailed Plan Adjacent	12/27/56	
	8-C	Paving, Grading, and Walks	12/28/56	
	9-C	Truck Wells-Plans and Details	12/28/56	
	10-C	Relocation of Oil Lines	12/28/56	
	11-C	Section and Details of Pavement	8/10/56	
		Building 340--Units A, B, and C, Ground Floor	8/9/56	
	4-A	Roof Details		
	41-A	Change House and Toilets No. 2 and 3, Details Sanitary Sewage	8/9/56	
	49-A	Magnesium Storage Unit D Plan		
		Elevation and Details	8/9/56	
	60-A	Pickling Area, Acid to Drains		
		Plumbing, Ground Floor Drains		
	66-M	Metals Unit Piping Diagram and Piping Plan Hydraulic System	1/2/57	
	101-M	Remelt Area	1/9/57	
	271-ME			
C-402	E10-2-A	Floor Plans and Sections	2/25/53	Smith, Hinchman, & Grylls, Inc.
C-405	E15-2-A	Floor Plan and Elevations	6/25/53	Smith, Hinchman, & Grylls, Inc.
C-410 and Area	E1-31-A	Plot Plan Showing Services		Singmaster & Breyer
	E1-37-A	HF Neutralization Building		
	E1-206-S	Feed Plant, HF Storage		
	E1-207-S	HF Neutralization Building Foundations		
	E1-209-S	HF Neutralization Area Sludge Lagoon		
	E1-214-S	Hydrogen Holder		
	E1-433-M	Hydrogen Holder		
C-420	101-M	Plumbing-Sanitary Water and Drainage Piping, Office Area	7/13/56	Giffels & Vallet, Inc.
	102-M	Plumbing-Sanitary Water and Drainage Piping	7/13/56	
	4-M			
	E-S-12318-A			
	P5E-13836-G	Oil Lines	9/13/73	
C-720	E3-11-A	1/8" Scale Floor Plan	11/3/54	Smith, Hinchman, & Grylls, Inc.
	E3-28-A	Details of Compressor Shop Pit	11/28/57	
	E3-43-A	Miscellaneous Details	6/20/53	
	E3-14-S	Miscellaneous Details-Acid Neutralization Pit		
	EM-13165-H	Compressor Shop Modification, Wastewater	4/19/73	Union Carbide Corp., Nuclear Division
	EM-13165-J	Compressor Shop Modification Shop, Degreaser	3/29/74	
	EM-13165-AN	Compressor Shop Modification, Degreaser	3/29/74	

INDEX OF ENGINEER DRAWINGS

Building	Drawing No.	Title	Date	Architect Engineer
Under-ground Utilities	EPF-P-6000	Utility Grid Master Plan	1/10/75	Union Carbide Corp., Nuclear Division
	EPF-P-6608-R-O	Contaminated Scrap	12/1/82	
	EPF-P-6309-R-O	Storm Drains	2/4/82	
	EPF-P-6409-R-O	Sanitary Sewers	2/3/82	
	EPF-P-6310-R-O	Wastewater and Storm Drains	12/18/81	
	EPF-P-6410-R-O	Sanitary Sewers	12/18/81	
	EPF-P-6311-R-O	Storm Drains	1/5/82	
	EPF-P-6514-R-O	Acid Drains	1/12/82	
	EPF-P-6614-R-O	Contaminated Scrap	1/12/82	
	EPF-P-6315-R-O	Storm Drains	3/3/82	
	EPF-P-6415-R-O	Sanitary Sewers	3/3/82	
	EPF-P-6615-R-O	Steam, Acid	3/3/82	
	EPF-P-6316-R-O	Storm Drains	3/3/82	
	EPF-P-6416-R-O	Sanitary Sewers	3/8/82	
	EPF-P-6616-R-O	Steam, Contaminated Drains	3/10/82	
	EPF-P-6317-R-O	Storm Drains	3/25/82	
	EPF-P-6417-R-O	Sanitary Sewers	3/16/82	
	EPF-P-6320-R-O	Storm Drains	2/1/82	
	EPF-P-6420-R-O	Sanitary Sewers	2/1/82	
	EPF-P-6321-R-O	Storm Drains	3/29/82	
	EPF-P-6421-R-O	Sanitary Sewers	3/29/82	
	EPF-P-6621-R-O	Steam and Condensate, Acid and Acid Drains, Contaminated Drains	3/31/82	
	EPF-P-6921-R-O	Propane, Fuel Oil, Pyrofax, Waste Oil Storage		
	EPF-P-6322-R-O	Storm Drains	4/5/82	
	EPF-P-6422-R-O	Sanitary Sewers	4/1/82	
	EPF-P-6622-R-O	Oil, Steam, and Condensate, Contaminated Drains	4/12/82	
	EPF-P-6623-R-O	Storm Drains	4/4/82	
	EPF-P-6423-R-O	Storm Drains	4/15/82	
	EPF-P-6425-R-O	Sanitary Sewers	5/6/82	
	EPF-P-6327-R-O	Storm Drains	2/28/82	
	EPF-P-6427-R-O	Sanitary Sewers	2/26/82	
	EPF-P-6328-R-O	Storm Drains	4/27/82	
	EPF-P-6428-R-O	Sanitary Sewers	4/27/82	
	EPF-P-6329-R-O	Storm Drains	4/21/82	
	EPF-P-6429-R-O	Sanitary Sewers	4/19/82	
	EPF-P-6334-R-O	Storm Drains	9/13/73	
	EPF-P-6335-R-O	Storm Drains	5/4/82	
	EPF-P-6435-R-O	Sanitary Sewers	4/29/82	
	EPF-P-6835-R-O	Acid	4/30/82	

INDEX OF ENGINEER DRAWINGS

Building	Drawing No.	Title	Date	Architect Engineer
Misc. Facilities	26T-CV-15	McGraw Temporary Construction Area	6/7/51	
	26T-CV-23	Parking Lot and Leaching Field for Pipe Fabrication Shop	9/27/57	
	26T-CV-58	Sewer and Water Main for KOW Area	4/21/54	
	26T-CV-61	Area Plot Plan "C" Project-Paducah Area	3/9/53	
	26T-CV-89	Area Mosaic		
	Unknown	Location Plan of Temporary Underground Facilities (Gas Station)		

APPENDIX D

BECHTEL JACOBS COMPANY LLC PROCEDURES

BECHTEL JACOBS COMPANY LLC PROCEDURES

Project-Wide Procedures

Procedure No.	Procedure Title	Rev. No.	Effective Date
PA-1001	Paducah Work Control Process	1	3/27/2000
PA-1003	Paducah Configuration Management Program	0	10/30/2000
PA-1005	Paducah Facility Safety Program	1	2/12/2001
PA-1007	Maintenance Work Coordination–Paducah	0	4/11/2001
PA-1009	Identification, Control, and Disposition of Suspect/Counterfeit Items	0	2/28/2001
PA-1010	Safety Team of Paducah (STOP) Committee	0	5/14/2001

Environmental, Safety, and Health Procedures

Procedure No.	Procedure Title	Rev. No.	Effective Date
CP2-EG-VE1001	Trenching, Excavation, and Penetration Permit	1 chg 0	10/2/2000
CP2-SS-FS1031	Welding, Burning, and Hotwork Permit	1 chg D	12/29/2000
CP2-SH-SH1031	Confined Space Program	2 chg 0	12/29/2000
CP2-SH-IS1063	Instructions of Safety and Health Work Permit	2 chg 0	12/29/2000
CP2-SH-IS1065	Instructions for Lockout/Tagout	4	2/19/2001
PA-2001	Defective Equipment Tags–Paducah	0	4/30/2000
PA-2002	Lead and Inorganic Arsenic Protection Program	0	4/16/2001
PA-2003	Industrial Equipment Operator Qualification Program	0	4/23/2001
PA-2004	Scaffolds and Ladders	0	4/23/2001
PA-2007	Industrial Motorized Trucks (Forklifts)	0	4/23/2001
PA-2008	Articulating Boom Work Platform Operation	0	4/23/2001
PA-2009	Paducah Fall Protection Program	0	4/23/2001

Uranium Programs Procedures

Procedure No.	Procedure Title	Rev. No.	Effective Date
PA-2400	Handling and Inspection of DOE 48-Inch UF_6 Cylinders at Paducah	0	5/1/2000
PA-2402	In-Storage Inspection of 12-Inch, 30-Inch, 48-Inch, and CV DOE UF_6 Cylinders at Paducah	0	5/1/2000
PA-2403	Weld Patch Repair of DOE UF_6 Cylinders at Paducah	0	6/8/2000
PA-2404	Field Replacement and Repair of UF_6 Cylinder Valves and Plugs at Paducah	0	5/1/2000
PA-2413	Handling and Inspection of 12-Inch Diameter UF_6 Cylinders at Paducah	0	6/8/2000

DMSAs Procedures

Procedure No.	Procedure Title	Rev. No.	Effective Date
PA-3002	Administration of DOE Material Storage Areas	0	2/1/2000
PA-3003	NCS Characterization, Movement, Storage, and Disposition of Fissionable Material within Paducah DOE Material Storage Areas	0	2/1/2000

PA-5104	Environmental Measurements Verification and Validation	0	3/29/1999
PA-5105	Volatile and Semivolatile Data Verification and Validation	0	4/13/1999
PA-5106	Pesticide and PCB Data Verification and Validation	0	2/22/1999
PA-5107	Inorganic Data Verification and Validation	0	4/17/1999
PA-5201	Assignment of Sample Numbers for Multiphase Environmental Samples	0	5/5/1995
PA-5203	Special Labeling Requirements for Samples	0 chg A	5/5/1995

D&D Project Procedures

Procedure No.	Procedure Title	Rev. No.	Effective Date
PA-6003	Use of Non-Fissile HEPA Filter-Equipped Vacuum Cleaners	0	4/23/2001
PA-6004	Operation and Maintenance of the Portable Concrete Crusher Plant	0	1/8/2001
PA-6005	Operation of Non-Fissile Negative Air Machines	0	4/23/2001
PA-6006	Administration of the Paducah DOE C-410 Complex	0	6/26/2001

APPENDIX E

MONITORING WELL PROGRAM INVENTORY

Note: Acronyms are defined on Page E-13 and E-14

Monitoring Well Program Inventory

Well Number	Screened Zone	Status	Sampled	Water Level	Inspection
MW 1	RGA	AB 94	NA	NA	NA
MW 2	Unknown	AB 88	NA	NA	NA
MW 3	Unknown	AB 88	NA	NA	NA
MW 4	Unknown	AB 88	NA	NA	NA
MW 5	Unknown	AB 88	NA	NA	NA
MW 6	Unknown	AB 88	NA	NA	NA
MW 7	UCRS	AB 94	NA	NA	NA
MW 8	UCRS	AB 94	NA	NA	NA
MW 9	RGA	AB 94	NA	NA	NA
MW 10	RGA	AB	NA	NA	NA
MW 11	UCRS	AB 94	NA	NA	NA
MW 12	RGA	AB 94	NA	NA	NA
MW 13	UCRS	AB 94	NA	NA	NA
MW 14	UCRS	AB 94	NA	NA	NA
MW 15	RGA	AB 94	NA	NA	NA
MW 16	UCRS	AB 94	NA	NA	NA
MW 17	RGA	AB 94	NA	NA	NA
MW 18	UCRS	AB 94	NA	NA	NA
MW 19	RGA	AB 94	NA	NA	NA
MW 20	RGA	Current***	GWESQ	NS	NR
MW 21	RGA	AB 94	NA	NA	NA
MW 22	RGA	AB 94	NA	NA	NA
MW 23	Porters Creek Clay Well	AB 94	NA	NA	NA
MW 24	Porters Creek Clay Well	AB 94	NA	NA	NA
MW 25	Porters Creek Clay Well	AB 94	NA	NA	NA
MW 26	Porters Creek Clay Well	AB 94	NA	NA	NA
MW 27	Porters Creek Clay Well	AB 94	NA	NA	NA
MW 28	UCRS	AB 94	NA	NA	NA
MW 29	UCRS	AB 94	NA	NA	NA
MW 30	UCRS	AB 94	NA	NA	NA
MW 31	UCRS	AB 94	NA	NA	NA
MW 32	UCRS	AB 94	NA	NA	NA
MW 33	UCRS	AB	NA	NA	NA
MW 34	UCRS	AB 94	NA	NA	NA

Monitoring Well Program Inventory

Well Number	Screened Zone	Status	Sampled	Water Level	Inspection
MW 71	UCRS	Current	GWESSA	WLQ	A
MW 72	UCRS	Current	NS	WLA	A
MW 73	RGA	Current	NS	WLA	A
PZ 74	RGA	Current	NS	WLA	A
MW 75	RGA	Current	NS	WLA	A
MW 76	RGA	Current	NS	WLA	A
MW 77	RGA	Current	NS	WLA	A
MW 78	RGA	Current	NS	WLA	A
MW 79	UCRS	Current	NS	WLA	A
MW 80	UCRS	Current	NS	WLA	A
MW 81	RGA	Current	NS	WLA	A
MW 82	UCRS	Current	NS	WLA	A
MW 83	RGA	Current	NS	WLA	A
MW 84	RGA	Current	404G	WLQ	Q
MW 85	UCRS	Current	404G	NS	Q
MW 86	RGA	Current	404G	NS	Q
MW 87	RGA	Current	404G	NS	Q
MW 88	UCRS	Current	404G	NS	Q
MW 89	RGA	Current	404G	NS	Q
MW 90	RGA	Current	404G	WLQ	Q
MW 91	UCRS	Current	404G	NS	Q
MW 92	RGA	Current	404G	NS	Q
MW 93	UCRS	Current	404G	WLQ	Q
MW 94	RGA	Current	404G	NS	Q
MW 95	RGA	Current	404G	NS	Q
MW 96	RGA	Current	GWESSA	NS	A
MW 97	RGA	AB 97	NA	NA	NA
MW 98	RGA	Current	GWESQ	WLQ	A
MW 99	McNairy	Current	GWESQ	WLQ	A
MW 100	RGA	Current	GWESQ	NS	A
PZ 101	UCRS	Current	NS	WLQ	A
MW 102	RGA	Current	GWESSA	WLQ	A
MW 103	RGA	Current	GWESSA	WLQ	A
MW 104	RGA	AB 96	NA	NA	NA
MW 105	RGA	AB	NA	NA	NA
MW 106	RGA	Current	GWESSA	WLQ	A

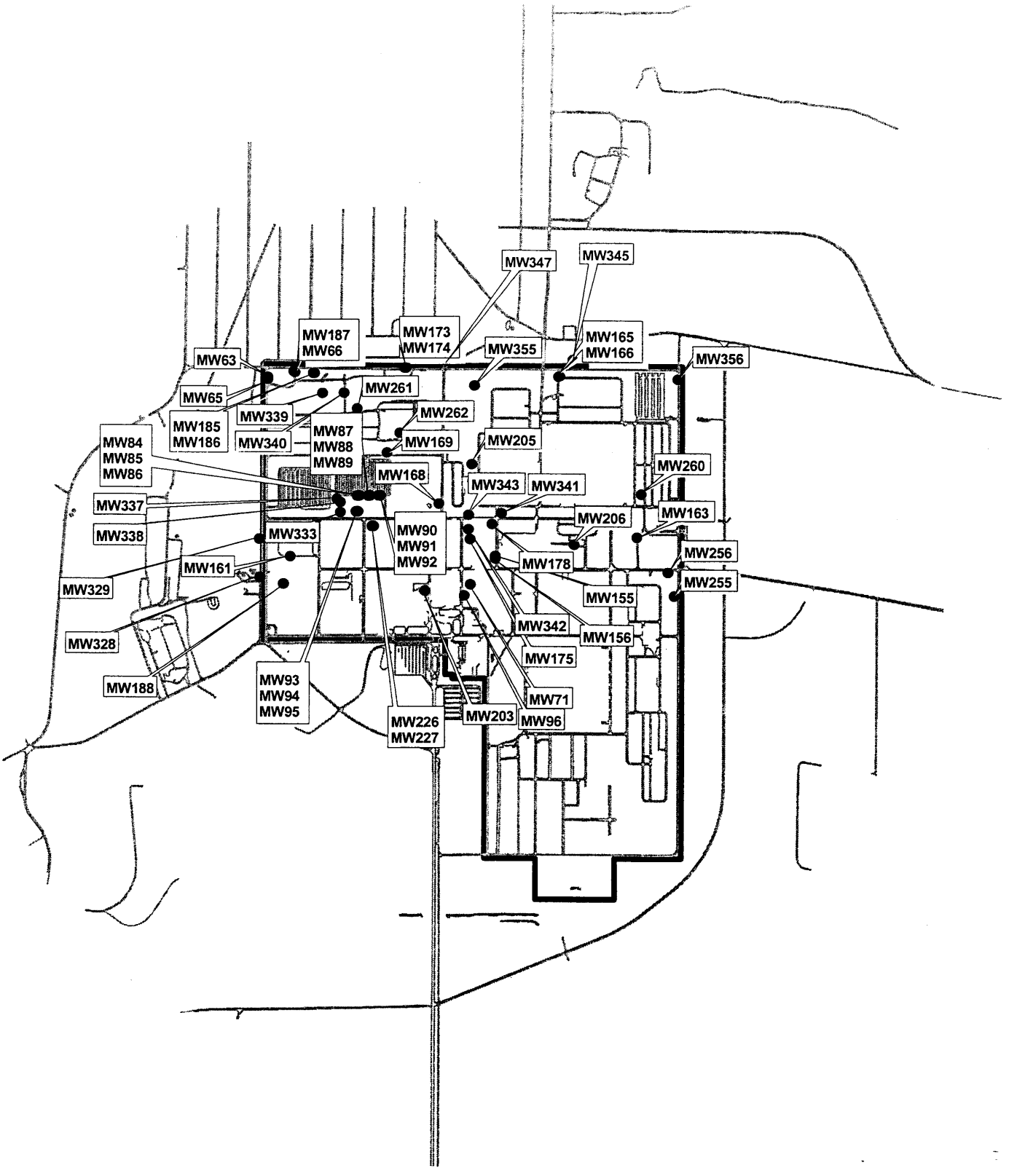
Monitoring Well Program Inventory					
Well Number	**Screened Zone**	**Status**	**Sampled**	**Water Level**	**Inspection**
MW 142	UCRS	AB 98	NA	NA	NA
MW 143	RGA	AB 98	NA	NA	NA
MW 144	Terrace Gravels	Current	NS	WLA	A
MW 145	RGA	Current	GWNEQ	NS	A
MW 146	UCRS	Current	GWESQ	WLQ	A
MW 147	UCRS	Current	NS	WLA	A
MW 148	RGA	Current	NS	WLA	A
MW 149	RGA	Current	NS	WLA	A
MW 150	UCRS	Current	GWESSA	WLQ	A
MW 151	RGA	Current	NS	WLQ	A
MW 152	RGA	Current	GWESQ	WLQ	A
MW 153	UCRS	Current	NS	WLA	A
MW 154	RGA	Current	NS	WLA	A
MW 155	UCRS	Current	GWESSA	NS	A
MW 156	RGA	Current	GWESSA	WLQ	A
MW 157	UCRS	Current	NS	WLA	A
MW 158	RGA	AB 99	NA	NA	NA
MW 159	UCRS	AB 99	NA	NA	NA
MW 160	UCRS	AB 99	NA	NA	NA
MW 161	RGA	Current	GWESSA	WLQ	A
MW 162	RGA	Current	NS	WLA	A
MW 163	UCRS	Current	GWESSA	WLQ	A
MW 164	UCRS	Current	NS	WLA	A
MW 165	UCRS	Current	GWESQ	WLQ	A
MW 166	RGA	Current	GWESQ	NS	A
MW 167	UCRS	Current	NS	WLA	A
MW 168	RGA	Current	GWESSA	WLQ	A
MW 169	UCRS	Current	GWESSA	WLQ	A
MW 170	UCRS	Current	NS	WLA	A
MW 171	RGA	Current	NS	WLA	A
MW 172	RGA	Current	NS	WLA	A
MW 173	UCRS	Current	GWESQ	WLQ	A
MW 174	RGA	Current	GWESQ	NS	A
MW 175	UCRS	Current	GWESSA	WLQ	A
MW 176	RGA	Current	NS	WLA	A
MW 177	Terrace Gravels	Current	NS	WLA	A

Monitoring Well Program Inventory					
Well Number	**Screened Zone**	**Status**	**Sampled**	**Water Level**	**Inspection**
MW 212	UCRS	Current	NS	WLA	A
MW 213	RGA	Current	NS	WLA	A
MW 214	RGA	Current	NS	WLA	A
MW 215	RGA	Current	NS	WLA	A
MW 216	RGA	Current	NS	WLA	A
MW 217	RGA	Current	NS	WLA	A
MW 218	RGA	Current	NS	WLA	A
MW 219	RGA	Current	NS	WLA	A
MW 220	RGA	Current	SG	NS	A
MW 221	RGA	Current	SG	NS	A
MW 222	RGA	Current	SG	NS	A
MW 223	RGA	Current	SG	NS	A
MW 224	RGA	Current	SG	NS	A
MW 225	UCRS	Current	NS	NS	A
MW 226	RGA	Current	404G	WLQ	Q
MW 227	RGA	Current	404G	WLQ	Q
EW 228	RGA	NA	NS	NS	NR
EW 229	RGA	NA	NS	NS	NR
EW 230	RGA	NA	NS	NS	NR
EW 231	RGA	NA	NS	NS	NR
MW 232	Unknown	Current	NS	NS	A
MW 233	RGA	Current	GWNWQ	WLQ	A
MW 234	RGA	Current	GWNWQ	WLQ	A
MW 235	RGA	Current	GWNWQ	WLQ	A
MW 236	RGA	Current	GWNWQ	WLQ	A
MW 237	UCRS	Current	GWNWQ	WLQ	A
MW 238	RGA	Current	GWNWQ	WLQ	A
MW 239	RGA	Current	GWNWQ	WLQ	A
MW 240	RGA	Current	GWNWQ	WLQ	A
MW 241	UCRS	Current	GWNWQ	WLQ	A
MW 242	RGA	Current	GWNWQ	WLQ	A
MW 243	RGA	Current	GWNWQ	WLQ	A
MW 244	RGA	Current	GWNWQ	WLQ	A
MW 245	RGA	Current	GWNWQ	WLQ	A
MW 246	UCRS	Current	GWNWQ	WLQ	A
MW 247	McNairy	Current	GWNWQ	WLQ	A
MW 248	RGA	Current	GWNWQ	WLQ	A
MW 249	RGA	Current	GWNWQ	WLQ	A

Monitoring Well Program Inventory					
Well Number	**Screened Zone**	**Status**	**Sampled**	**Water Level**	**Inspection**
MW 285 Not Installed	NA	NA	NA	NA	NA
MW 286 Not Installed	NA	NA	NA	NA	NA
PZ 287	RGA	Current	NS	WL-NE	A
MW 288	RGA	Current	GWNEQ	NS	A
PZ 289	RGA	Current	NS	WL-NE	A
PZ 290	RGA	Current	NS	WL-NE	A
MW 291	RGA	Current	GWNEQ	NS	A
MW 292	RGA	Current	GWNEQ	NS	A
MW 293	RGA	Current	GWNEQ	NS	A
MW 294	RGA	Current	GWNEQ	NS	A
MW 295 Not Installed	NA	NA	NA	NA	NA
MW 296 Not Installed	NA	NA	NA	NA	NA
MW 297 Not Installed	NA	NA	NA	NA	NA
MW 298 Not Installed	NA	NA	NA	NA	NA
MW 299 Not Installed	NA	NA	NA	NA	NA
MW 300	Terrace Gravels	Current	KG	WLQ	A
MW 301	Terrace Gravels	Current	KG	WLQ	A
MW 302	Terrace Gravels	Current	KG	WLQ	A
MW 303	Terrace Gravels	AB 94	NA	NA	NA
MW 304	Terrace Gravels	Current	NS	WLA	A
MW 305	Eocene	Current	GWESSA	WLQ	A
MW 306	Eocene	Current	NS	WLA	A
MW 307	Eocene	Current	NS	WLA	A
MW 308	Eocene	Current	NS	WLA	A
MW 309	Terrace Gravels	Current	NS	WLA	A
MW 310	Terrace Gravels	Current	NS	WLA	A
MW 311	Terrace Gravels	Current	NS	WLQ	A
MW 312	UCRS	Current	NS	WLA	A
MW 313	UCRS	Current	NS	WLA	A
MW 314	UCRS	Current	NS	WLA	A
MW 315	UCRS	Current	NS	WLA	A
MW 316	UCRS	Current	NS	WLA	A
MW 317	Terrace Gravels	Current	NS	WLA	A

Monitoring Well Program Inventory					
Well Number	**Screened Zone**	**Status**	**Sampled**	**Water Level**	**Inspection**
PZ 351	RGA	Current	NS	NS	A
MW 352	RGA	Current	GWESQ	NS	A
MW 353	RGA	Current	SG	NS	A
MW 354	RGA	Current	GWESQ	NS	A
MW 355	RGA	Current	GWESQ	NS	A
MW 356	McNairy	Current	GWESQ	NS	A
PZ5G	Unknown	Current	NS	WLA	A
PZ5S	Unknown	Current	NS	WLA	A
Z-12	Unknown	Current	NS	WLQ	A
Z-16	Unknown	Current	NS	WLQ	A
R2	Unknown	Current	GWRESM	NS	NR
R9	Unknown	Current	GWRESS	NS	NR
R12	Unknown	Current	GWRESS	NS	NR
R13	Unknown	Current	GWRESS	NS	NR
R14	Unknown	Current	GWRESS	NS	NR
R19	Unknown	Current	GWRESS	NS	NR
R20	Unknown	Current	GWRESS	NS	NR
R21	Unknown	Current	GWRESS	NS	NR
R23	Unknown	Current	GWRESS	NS	NR
R72	Unknown	Current	GWRESS	NS	NR
R82	Unknown	Current	GWRESS	NS	NR
R83	Unknown	Current	GWRESS	NS	NR
R90	Unknown	Current	GWRESS	NS	NR
R114	Unknown	Current	GWRESS	NS	NR
R294	Unknown	Current	GWRESM	NS	NR
R302	Unknown	Current	GWRESM	NS	NR
R381	Unknown	Current	GWRESS	NS	NR
R383	Unknown	Current	GWRESS	NS	NR
R384	Unknown	Current	GWRESS	NS	NR
R387	Unknown	Current	GWRESS	NS	NR
R392	Unknown	Current	GWRESS	NS	NR
R424	Unknown	Current	CARB	NS	NR

***:	MW20 and R4 are the same wells
404G:	C-404 Landfill groundwater well
A:	Annual inspection
AB:	Abandoned
AB-IP	Abandoned in place
A-TS:	Inspect only, transducer in well
EW:	Extraction well



LEGEND:

● Monitoring Well Location

500 0 500 1000 Feet

TRUE NORTH 20° PLANT NORTH

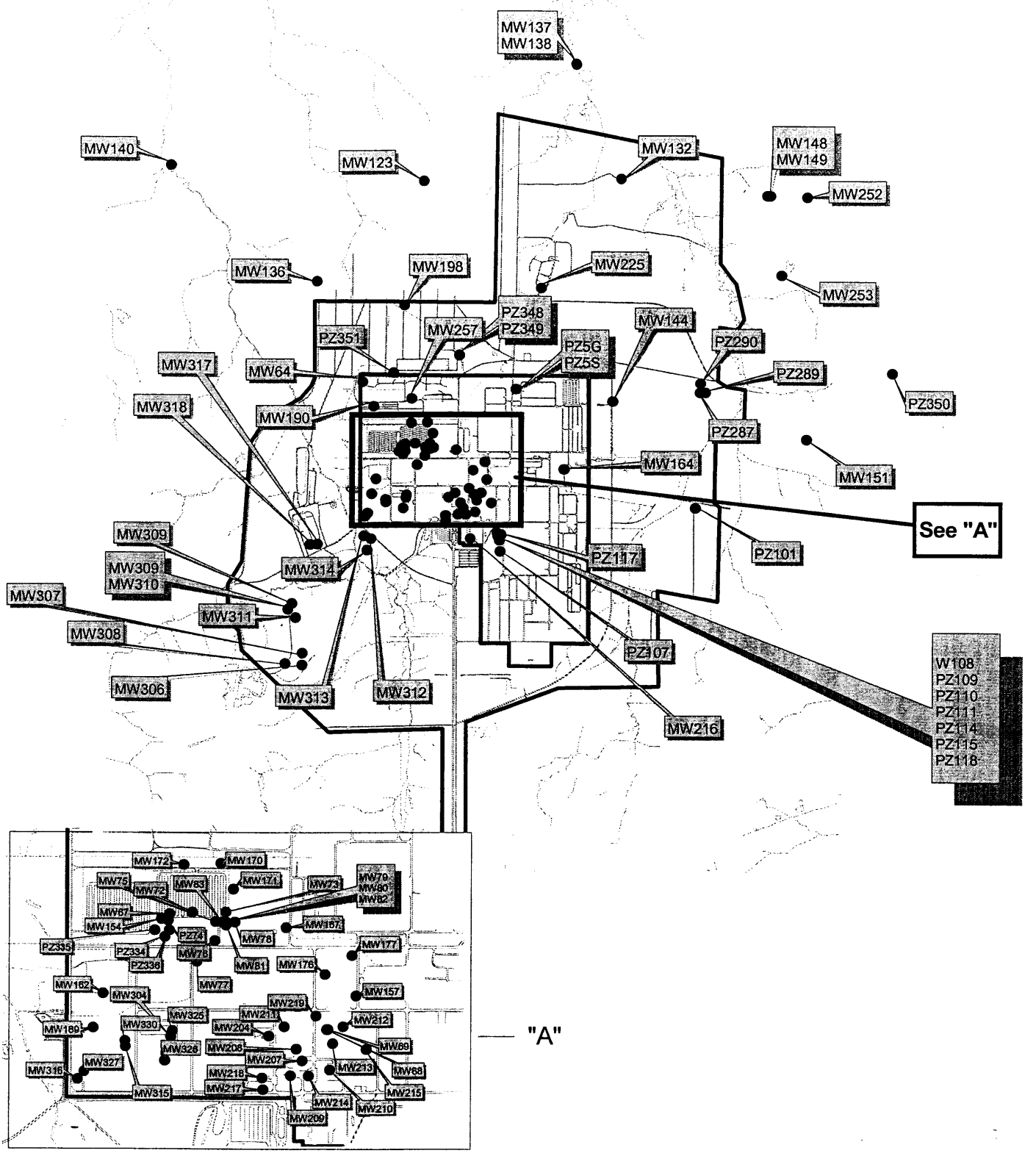
Wells sampled inside the perimeter fence.

U.S. DEPARTMENT OF ENERGY
DOE OAK RIDGE OPERATIONS
PADUCAH GASEOUS DIFFUSION PLANT

BECHTEL JACOBS COMPANY LLC
MANAGED FOR THE US DEPARTMENT OF ENERGY UNDER US GOVERNMENT CONTRACT DE-AC-05-98OR22700
Oak Ridge, Tennessee • Paducah, Kentucky • Portsmouth, Ohio

CDM Federal Services Inc.
A subsidiary of CDM Federal Programs Corporation

FIGURE No. c5ac90002sk022.apr
DATE 07-31-01



LEGEND:

- Monitoring Well Location

900 0 900 1800 Feet

TRUE NORTH 20° PLANT NORTH

Wells not routinely sampled at the Paducah Site

U.S. DEPARTMENT OF ENERGY
DOE OAK RIDGE OPERATIONS
PADUCAH GASEOUS DIFFUSION PLANT

BECHTEL JACOBS COMPANY LLC
MANAGED FOR THE US DEPARTMENT OF ENERGY UNDER US GOVERNMENT CONTRACT DE-AC-05-98OR22700
Oak Ridge, Tennessee • Paducah, Kentucky• Portsmouth, Ohio

CDM Federal Services Inc.
A subsidiary of CDM Federal Programs Corporation

FIGURE No. c5ac90002sk025.apr
DATE 07-31-01

Monitoring wells not shown on maps

The following monitoring wells are not shown on any of the previous maps. These wells have no coordinates listed in Paducah OREIS.

Abandoned wells

MW-10
MW-59
MW-60
MW-61
MW-62
MW-105
MW-119

Wells not routinely sampled

MW-232
PZ-112
PZ-113
PZ-116
PZ-251
Z-12
Z-16

APPENDIX F

DEPARTMENT OF ENERGY MATERIAL STORAGE AREA MAPS

Large Maps
& Drawings
That Contain
OPSEC
Concerns

If you wish to
View Contact
BJC security
441-5037